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OF THE

BRITISH ORNITHOLOGISTS' CLUB

EDITED BY

JOHN J. YEALLAND

Volume 85

1965

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EDITED BY
JOHN J. YEALLAND

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PREFACE

ATTENDANCE at the meetings held during 1965 numbered 226 members and guests.

An experimental departure from the usual dinner took place at the November meeting when a buffet supper was held. This form of meeting will continue as a periodic feature of the programme and it promises to be successful provided that a suitable venue can be found.

In the absence of Mrs. B. P. Hall, Dr. J. G. Harrison kindly undertook the compilation of this Index. To him and to all those who have spoken at the meetings, as well as to those who have supported the *Bulletin* with so wide and interesting a range of papers, we are extremely grateful.

The Caxton and Holmesdale Press has continued its ready help and a special word of appreciation is due to the Manager, Mr. K. E. Wiltsher.

J. J. YEALLAND.

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Keith, G. Stuart Esq., American Museum of Natural History, Central Park West, New York 24, U.S.A.
Wise, A. J. Esq., 17 Norfolk Avenue, Christchurch, Hants.

Resigned

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Goodwin, Miss V.
The following Members names were removed from the list under Rule 3.
Jeffery, Major E. N. B.
Kasparyan, Dr. Aran.
Moss, R.
Stronach, B. W. H.
Fennell, C. M.

Died

The Committee announce with regret the deaths of the following members.
Boddy, Stephen Esq.; Godman, Miss Eva; Tunmore, B. G. Esq.

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The six hundred and twenty-first meeting of the Club was held at the Rembrandt Hotel, London, on 15th December, 1964.

Chairman: Mr. R. S. R. Fitter

Members present 29; Guests 6.

Dr. D. W. Snow spoke on the displays of certain manakins (Pipridae), illustrating these remarkable phenomena with films and recordings.

Notes on a small collection of birds made in Eastern Nigeria

by William Serle

Received 20th October, 1964

In November 1959 Gilbert Nkwocha, my former bird skinner, made a collection of birds in Eastern Nigeria, in the rain forest belt, at Umuagwa 5° 20′ N, 6° 55′ E, altitude about 100 feet.

The 53 specimens, belonging to 34 species, were all taken in the forest interior in primary or second growth. Of special interest are the following:–

Phoeniculus bollei bollei (Hartlaub).

1 adult ♂. One of two in a dead tree in the primary forest. Recorded for the first time from Eastern Nigeria.

Scoptelus castaneiceps castaneiceps (Sharpe).

1 adult ♂. Wing 104 mm.; tail 173 mm.; exposed culmen 34 mm.; tarsus 18 mm. Head pale brown.

One of two in the forest tree-tops. The range of the nominate race is extended eastwards and the species is recorded for the first time from Eastern Nigeria.

Trichophorus calurus calurus Cassin.

3 adult ♂, 1 adult ♀.

In the *Ibis* 1957: 632–633 I discussed the view (Berlioz, *Bull. Mus. Hist. Nat.* 1954: 68 and 1955: 189) that the *Trichophorus calurus* population comprises two sibling forms, a view with which White (*Bull. Brit. Orn. Cl.*, 76, 1956: 158) and Rand (*Fieldiana, Zool.*, (1958) 35: 217–219) are in agreement. In the light of their remarks I have re-examined my series of *T. calurus* together with a further 16 skins collected in 1955–1959, in all 72 adults, all from Eastern Nigeria and British Cameroons.

I find that the series, judged visually, can be divided into a slender-billed and a stout-billed group. The measurements of the breadth of the bill at the nostrils confirm the visual judgement, the two groups, in respect of this measurement being separate, without intermediates. Other bill measurements, namely the depth at the nostrils and the length of the culmen show a difference in range but with some overlap. The wing lengths of the two groups do not differ significantly. Measurements in millimetres of the two groups are as follows:—

Stout-billed group

Length of culmen: 36 ♂, 17–21; 23 ♀, 17–20.
Breadth of bill at nostrils: 36 ♂, 6–8; 23 ♀, 6–7½.
Depth of bill at nostrils: 36 ♂, 6–7; 23 ♀, 6–7.
Wing: 36 ♂, 82–93; 23 ♀, 78–88 (1 94).

Slender-billed group

Length of culmen: 10 ♂, 15–17; 3 ♀, 15–17.
Breadth of bill at nostrils: 10 ♂, 5–5½; 3 ♀, 5.
Depth of bill at nostrils: 10 ♂, 5–6; 3 ♀, 5–6.
Wing: 10 ♂, 81–90; 3 ♀, 80–81.

In this series there is considerable individual variation in colour. There are no clear-cut colour differences between the two groups. In the slender-billed group the crown tends to be greyer and less brown, the green of the mantle and the yellow of the under parts tend to be duller in shade, and the under tail-coverts tend to be more buff-coloured and less yellow.

Birds of the two groups could not be distinguished in the field. The notes made at the time the specimens were collected reveal no differences in their habits. All 13 slender-billed birds were collected in primary or secondary forest, in all cases but two from mixed bird parties or from parties of their own species. Six stomachs examined contained insects only. All 59 stout-billed birds were likewise collected in primary or secondary forest and all were members of mixed bird parties or of parties of their own species. Of 35 stomachs examined 34 contained insects only and one contained insects and fruit.

I think it has still to be proved that the two groups are biologically separated.

Dyaphorophyia tonsa Bates.

2 adult ♂, Wing 54, 53 mm.

In primary forest. Both were members of mixed bird parties. A rare species.

Macrosphenus kempi flammeus Marchant

1 ♂. Wing 56 mm.; tail 31 mm. Testes undeveloped. Skull cartilaginous.

In colour intermediate between the juvenile and adult plumage. The greenish upper parts of the immature dress are retained, but much of the yellow wash of the under parts has been lost, and the flame colour of the adult flanks is incompletely developed. A rare form.

Dicrurus adsimilis coracinus (Verreaux.)

1 adult ♂.

Clearly the race *D. a. coracinus*. A series of seven *D. adsimilis* collected further north in Eastern Nigeria at Ishiagu, 5° 57′ N, 7° 35′ E, Mamu, 6° 10′ N, 7° 10′ E, and Enugu, 6° 25′ N, 7° 30′ E, belong to *D. a. atactus* Oberholser (Serle, 1957, *Ibis* 99: 658) as do one male and one female collected by me still further north at Ugugu, 7° 5′ N, 7° 30′ E, Kabba Province, and previously unrecorded.

In this part of West Africa *D. a. atactus* appears to occupy a wide belt of the savanna immediately to the north of the rain forest. It is probable that this belt will eventually be shown to extend westwards through Benin and Ondo Provinces to link up with the Upper Guinea population of *atactus* from Lagos westwards (Peters, 1962, *Check-list of birds of the World*, vol. 15, p. 140).

Chlorophoneus multicolor multicolor (Gray).

1 adult ♂. An example of the rare black-chested phase.

The remaining specimens are listed hereunder:—

Cuculus solitarius solitarius (Stephens). 1 adult ♀.
Cuculus cafer gabonensis Lafresnaye. 1 adult ♂.
Tockus camurus subsp. 1 adult ♀.
Gymnobucco calvus calvus (Lafresnaye). 1 adult ♂, 1 adult ♀.
Mesopicos pyrrhogaster (Malherbe). 1 adult ♂.
Smithornis rufolateralis rufolateralis Gray. 2 adult ♂.
Illadopsis rufipennis rufipennis (Sharpe). 1 immature ♀.
Illadopsis fulvescens iboensis (Hartert). 2 adult ♂.
Bleda syndactyla multicolor Bocage. 1 adult ♂.
Chlorocichla simplex (Hartlaub). 1 adult ♀.
Ixonotus guttatus guttatus Verreaux. 1 adult ♂.
Phyllastrephus icterinus icterinus (Bonaparte). 2 adult ♂.
Andropadus ansorgei ansorgei Hartert. 1 adult ♂, 1 adult ♀.
Andropadus curvirostris curvirostris Cassin. 1 adult ♂.
Erythrocercus mccallii mccallii (Cassin). 1 adult ♂. 1 adult ♀. 1 immature unsexed.
Terpsiphone smithii neumanni Stresemann. 1 adult ♂, 1 adult ♀.
Macrosphenus concolor (Hartlaub). 1 adult ♂, 1 adult ♀.
Dicrurus atripennis Swainson. 1 adult ♂.
Oriolus brachyrhynchus laetior Sharpe. 1 adult ♀.
Onychognathus fulgidas hartlaubii Hartlaub. 1 adult ♀.
Cyanomitra cyanolaema octaviae Amadon. 1 adult ♀.
Anthreptes collaris nigeriae White. 1 immature ♀.
Anthreptes fraseri cameroonensis Bannerman. 2 adult ♂, 2 immature ♂, 2 adult ♀.
Malimbus rubricollis rubricollis (Swainson). 1 adult ♂.
Malimbus malimbicus nigrifrons (Hartlaub). 1 adult ♂.
Malimbus scutatus scutopartitus (Reichenow). 2 adult ♂.
Nigrita canicapilla canicapilla (Strickland). 1 adult ♀.

Notes on the nomenclature of the whistling-thrushes

by H. G. Deignan

Received 18th November, 1964

In an age of servile dependence on the standard works of ornithological reference, it seems to me important to correct as soon as possible certain *lapsus* that appear in the treatment of the genus *Myophonus* in Volume X of Peters' *Check-list of Birds of the World.*

On page 142, the *correct* citation for *Myophonus caeruleus temminckii* would read: *Myophonus Temminckii* Vigors, 1832 (Mch. 2), Proc. Comm. Sci. Corr. Zool. Soc. London, pt. 1, p. 171—Himalaya. (G. R. Gray was, in 1822, a youth of fourteen!)

It is, however, with the footnote on page 140 that I wish more particularly to deal.

The first citation for Genus *Myophonus* Temminck should read: *Myophonus* Temminck, 1822 (Dec.) Pl. col., livr. 29, pl. 170 and text. Type, by monotypy, *Myophonus metallicus* Temminck. (The plate is lettered *Myophone luisant*).

The name next appears in literature as *Myiophonus* Boie, 1829, Isis, p. 1029, *lapsus* or *nomen emendatum.*

Its third guise, accompanied by a proper generic diagnosis, is *Myiophoneus* Temminck, 1832 (*post* Mch. 2), Pl. col., livr. 29, p. [211].

At this third appearance the genus is expanded to include, in addition to *M. flavirostris* (Horsfield), 1821 (May), with which *M. metallicus* Temminck, 1822, is now synonymized; also:—

(1) *Myophonus Horsfieldii* Vigors, 1831 (Mch. 2), corrupted to *Myiophoneus* [*sic*] *Horsfeldii* [*sic*];

(2) *Myophonus Temminckii* Vigors, 1832 (Mch. 2), changed to *Myiophoneus* [*sic*] *Temminckii*;

(3) *Pitta glaucina* Temminck, 1823 (Apr.), here listed as *Myiophoneus* [*sic*] *glaucinus* and cited from pl. 190 [*sic*] (correctly, pl. 194).

The footnote on page 140 of Peters' Volume X states that the generic name should be "*Myiophoneus*," because it so appears, emendated from *Myophonus*, on the page (properly *sheet*) preceding the description of *Myophonus metallicus* Temminck, 1822.

Since, however, that preceding sheet cites species named in April 1823, on 2nd March 1831, and on 2nd March 1832, it could not have been issued *prior* to 2nd March 1832 (as a replacement of an earlier and discarded sheet?). There is then no such name as "*Myiophoneus* Temminck and Laugier, 1822", as supposed by Delacour (Auk, 1942, p. 246) and by the revisor of the whistling-thrushes for Peters' *Check-list.*

To complete the confusion, we find Temminck using, in the Tableau Méthodique of January 1839, which summarizes the *Planches Coloriées*, both *Myophonus* and *Myiophoneus* on the same page 15!

If stability in ornithological nomenclature be considered desirable, why are we asked to use a so-called emendation (in fact a wholly new generic name!) that *first* appeared in print some ten years *after* the simple, easily spelled and easily pronounced *Myophonus* Temminck of 1822?

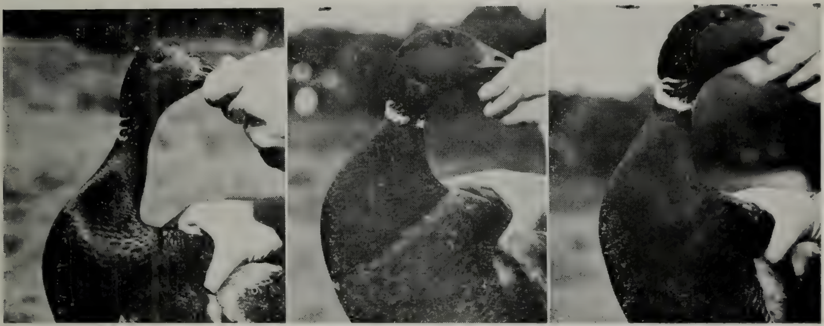
The white collar of the Russian Brent Goose

by JAMES M. AND JEFFERY G. HARRISON

Received 21st July, 1964

We are much indebted to Mr. Jack Williams of Tunstead, Norfolk, for allowing us to study a remarkable example of the Russian Brent Goose *Branta bernicla bernicla* Linnaeus, which he has kept in captivity for a number of years, the bird originally being caught on the north Norfolk coast.

The three photographs illustrating this note show on the left, a typical adult Russian Brent; in the centre the bird in question, and on the right, an example of the Pacific Brent *B. b. orientalis* Tugarinov. All three birds are in Mr. Williams' collection.



Photographs : Pamela Harrison

Russian Brent Variant Russian Brent Pacific Brent

It will be seen that the degree of white collar illustrates a cline of increasing whiteness from left to right, or west to east. It is possible that the centre bird comes from a breeding area in the extreme eastern range of *B. b. bernicla*, for the white collar is considerably more extensive than usual, being broader and almost but not quite meeting anteriorly. It is also more extensive posteriorly.

However, if this was merely an example of clinal variation, it is strange that there is no indication of this in the flank markings, which are quite typical of *B. b. bernicla*. It is more likely that this is another variant character, similar to the black V marking found occasionally on the chins of European Eiders *Somateria mollissima mollissima* (Linnaeus) and constantly in the Pacific Eider *S. m. v-nigra* Gray.

In its characters, this Brent from north Norfolk might be mistaken for the mysterious Lawrence's Brent *B. b. nigricans* Lawrence, which according to Delacour (1954) is thought to nest in the north-east of Hudson Bay and is possibly nearing extinction.

We are very grateful to Mr. Williams; also to Dr. Pamela Harrison for the photographs.

Reference:
Delacour, J. (1954). *The Waterfowl of the World*, vol. 1, London.

A new species of tinker-barbet from Northern Rhodesia

by C. W. Benson and M. P. Stuart Irwin

Received 20th October, 1964

During a recent collecting trip to the North Western Province of Northern Rhodesia, made under the auspices of Mr. C. W. Benson of the

Rhodes-Livingstone Museum, M. P. Stuart Irwin, accompanied by Benson's African collector, Jali Makawa, obtained in *Cryptosepalum* woodland, a tinker-barbet of the genus *Pogoniulus* Lafresnaye, that appears to represent an undescribed species. That a new barbet remained to be discovered at this late stage in the ornithological exploration of Northern Rhodesia, indeed in Africa as a whole, has come as a very considerable surprise. Nevertheless, it appears to us so obviously distinct from any of its nearest relatives, that we have no hesitation in introducing it as a species new to science as:—

Pogoniulus makawai sp. nov.

Description: A small barbet of the genus *Pogoniulus*, apparently most closely related to *Pogoniulus bilineatus* (Sundevall), and when compared with *P. b. mfumbiri* (Ogilvie-Grant), alongside which it is found sympatrically, of generally somewhat heavier build, though this is not reflected in measurements, and further differing from it in both pattern and colour.

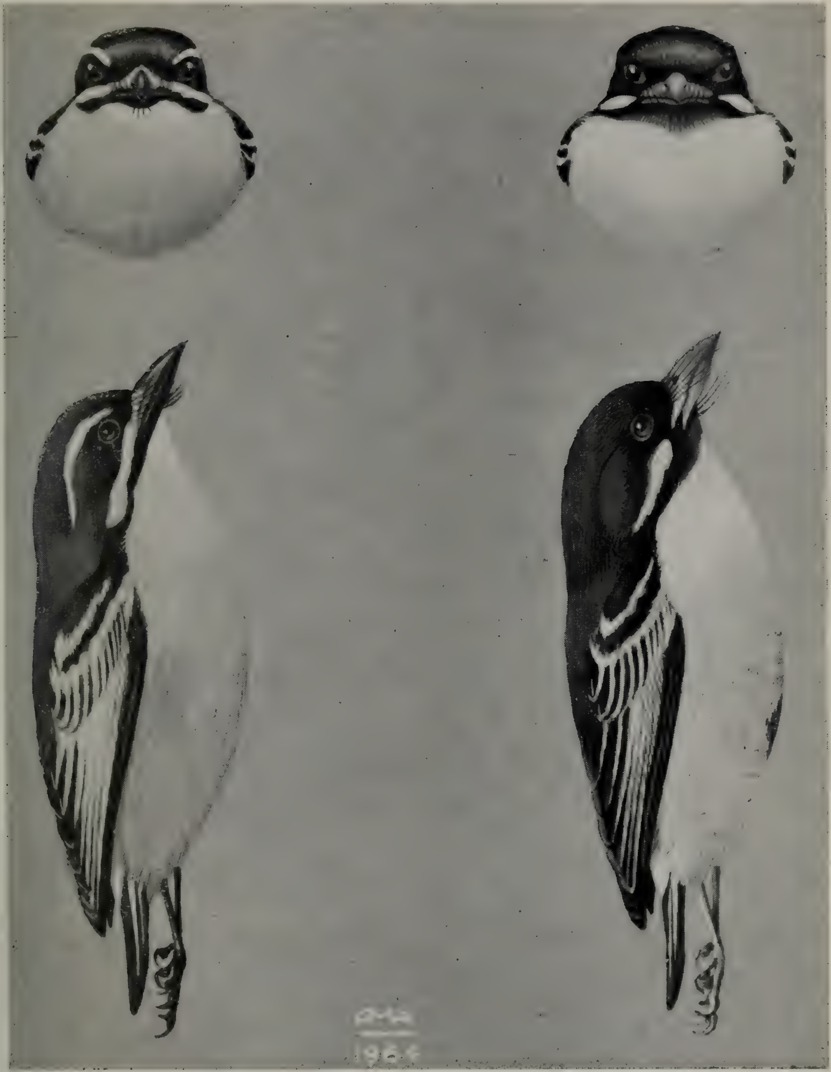
Plumage above: Forehead, crown, mantle and wings black, with a greenish gloss, similar to some specimens of *mfumbiri*, though this is variable. In the pattern of the head it differs in lacking a pale supra-orbital stripe or any white on the forehead but with pale cream-white line running from the gape to behind the black ear-coverts, joining with the pale under parts, from which it is separated by a black malar streak. Rump lemon yellow, rectrices narrowly bordered with yellow on the outer webs, thus essentially similar to *P. bilineatus*, but yellow edges to secondaries and wing-coverts paler, possibly slightly narrower.

Plumage below: Chin black, confluent with malar stripe and flecked with white in centre. Throat and upper chest cream-white with faint black shadow bars, fading into yellow on the lower chest. Lower chest and abdomen to flanks, pale lemon yellow, without the greenish tinge of *mfumbiri*, centre of abdomen with a conspicuous black patch and whole of under parts below the chest again with pale blackish shadow barring. Under side of the bend of the wing black, in contrast to the coverts, not white as in *mfumbiri*. The tibial feathering is more suffused with black. It should also be noted that the bases of the feathers on both the mantle and the under parts are light in *makawai* whereas, they are dark in *bilineatus*.

Bill relatively heavy with culmen more strongly arched, less conical than is usual in the genus. In comparison with the sympatric *mfumbiri* the bill appears notably broad and heavy with the cutting edges of the upper mandible flared around the gape and overlapping the lower mandible rather more, but equally broad bills are found in some other races of *bilineatus*. Rictal bristles well developed, comparable with the most heavily bristled individuals of *bilineatus*. Legs and feet markedly paler and slightly more robust with longer tarsus.

Soft parts: In life: eye dark brown; bill black, whitish basally and from below nostrils to half way along cutting edges; tarsus and feet whitish-flesh, toes with claws equally pallid.

Measurements: Wing 56; tail 32; tarsus 15; culmen from base of skull 13 mm.



Pogoniulus bilineatus mfumbiri (left) *Pogoniulus makawai* (right)

Type: Unique. An adult breeding male, testes 9 x 6.5 and 7 x 6mm. Collected 4 miles north of Mayau, Kabompo District, Northern Rhodesia, at approximately 12° 42′ S., 24° 16′ E. on 6th September, 1964, by Jali Makawa and M. P. Stuart Irwin, after the former of whom we have great pleasure in naming this new species. Deposited in the British Museum (Natural History). B.M. registration No. 1964. 33.1.

Distribution: So far known only from the type locality.

Remarks: This surprising new barbet would seem to be related to *P. bilineatus*, alongside which it occurs, two specimens of this latter species having also been collected in the same locality, but neverthless as shown above quite distinct both structurally and in colour pattern, though both being fully sympatric, they cannot be included within the same superspecies, nor does it appear that *P. makawai* can readily be associated directly with any other members of the genus. It is remarkable enough, that within *Cryptosepalum* woodland, not only *P. makawai* and *P. bilineatus* appear to be able to live side by side, but the widespread *P. chrysoconus* was also found in the same habitat, though no larger species of barbet appeared to be present. Usually there is strict ecological separation in Northern Rhodesia, and elsewhere, between *P. bilineatus* (evergreen forest or rich dense scrub), and *P. chrysoconus* (savannah woodland generally). In this case three small and similar-sized congeneric barbets seem able to co-exist. The result, therefore, may be strong interspecific competition. *P. bilineatus* and *P. chrysoconus* appeared largely to live in the canopy of the taller *Cryptosepalum*, and *P. makawai* was likewise collected high up. Competition would, therefore, be expected to be intense under such presumed ecological stress. Though the precise ecological requirements of *P. makawai* remain to be determined, it is quite possible that its requirements are in some way met by the dense underlying thickets or ''mavunda'' that typify *Cryptosepalum*, comprising *Canthium malacocarpum*, *Diospyros undabunda*, etc. with such lianes as *Carpodinus*, *Combretum microphyllum*, *Uvaria* and *Artabotrys*. (see Trapnell *et al. The Soils, Vegetation and Agricultural Systems of North-Western Rhodesia*, Lusaka, 1957 : 11) and Rattray and Wild, *Kirkia*, 2, 1961/62 : 98).

It is therefore not unexpected that among three sympatric, ecologically competing species of *Pogoniulus*, at least one should have undergone some functional modification, and that some of the differences in the new species show strongly the possibility of somewhat different feeding habits, with the degree of adaptive differentiation reflecting in the bill. Increased competition is an important factor of evolutionary significance. This process may well have hastened speciation, though how or where this took place in essential isolation can only be speculated upon. More so if one assumes that *P. bilineatus* is indeed phylogenetically its closest relative, even though the colour pattern is not identical.

Goodwin, (*Ibis*, 106, 1964 : 206–218), has recently discussed the African genera of barbets, in which there has been greater adaptive radiation than elsewhere, and has shown the presumed relationships within *Pogoniulus* in which the species *bilineatus*, *subsulphureus* and *atro-flavus* are closely linked, though none form superspecies, and to this group one must now add *P. makawai*. The question of the limits of the genus *Lybius*, closely related to the *Pogoniulus* group, depends on the validity of a notched bill as denoting actual phylogenetic relationship. In this respect it is significant that *P. makawai* has in the bill, though lacking notching, developed certain similarities to *Lybius*. The black chin, shadow-barring on the throat and abdomen, and the black patch on the abdomen, not found elsewhere in any other species of *Pogoniulus*, is in fact paralleled in *Lybius* and argues the question of polyphyletic relationships within the *Pogoniulus-Lybius* complex, as tentatively suggested by Goodwin, dependant upon the development or otherwise of notching and its ecological significance in the reduction of interspecific competition.

It may at this stage be assumed with some assurance, that *P. makawai* is most probably endemic to *Cryptosepalum* woodland on Kalahari sand, with its associated understory of dense thicket. *Cryptosepalum* has remained the only vegetation type poorly known ornithologically and if *P. makawai* occured in either evergreen forest or the widespread *Brachystegia* woodlands, all of which have been very thoroughly worked, its discovery would hardly have been so long delayed. The probability, therefore, is that *P. makawai* may qualify as a ''rare bird'' in the sense of Hall and Moreau [*Bull. B.M.* (*N.H.*) *Zoology*, 8(7): 1960, 316], with a total distributional range restricted to within a distance of 250 miles in any one direction.

That such distinctive forms as the red-necked race of crested guineafowl *Guttera edouardi kathleenae* White; *Batis margaritae kathleenae* White (=*Batis capensis kathleenae* in White, ''*Revised Check List of African Flycatchers*, etc.'' 2, 1963: 25); *pace* Benson and White, *Check List of the Birds of Northern Rhodesia*, should appear largely to be confined to this vegetation type, to which one might add *Malaconotus viridis* (Vieillot) in this part of its range, points to its significance as an evolutionary centre.

It is suggested that a suitable trivial name for *P. makawai* is White-chested Tinker-barbet. In life it could be most easily distinguishable from the Golden-rumped Tinker-barbet by its creamy white, not grey throat and upper chest.

We have to thank Mrs. B. P. Hall who has examined the type, for reading through and commenting upon this description, Mr. Derek Goodwin who not only read through the description in draft, but whose valued comments are expressed in the note that follows, and Commander A. M. Hughes for the drawing.

Some remarks on the new barbet

by DEREK GOODWIN

I have examined the type of *Pogoniulus makawai* and compared it with the series of *Pogoniulus* species in the British Museum (Natural History). As *P. makawai* and *P. bilineatus mfumbiri* are sympatric, their differences cannot be racial in character. I think the authors are correct in considering *makawai* to be a good species but that, until further specimens are identified, the possibility of its being an aberrant individual of *P. bilineatus* cannot be entirely excluded.

The colour differences between *makawai* and *mfumbiri* involve the former having more extensive black pigmentation on the head, underwing and centre of belly (lack of superciliary stripe, blackish throat and belly spot) combined with a lack of melanin suffusion on the breast and belly feathers so that these are white or yellowish-white, not grey as in *mfumbiri*. This latter seems responsible for the clearer white breast and yellow belly of *makawai*. These feathers do not entirely lack melanin as they show the narrow, dusky shadow bars mentioned in the description and which are not found in *P. b. fischeri* which is otherwise very close to *makawai* in colour of its under parts. *P. makawai* also lacks melanin on the bases of its back and mantle feathers which are yellowish-white at the base in striking contrast to the dark grey of *mfumbiri* and other forms of *bilineatus*. It would be most unusual, but not unprecedented for an aberrant individual to have more melanin than normal in some areas and less elsewhere; an example from the barbets is a specimen of *L. undatus* (sketch in Goodwin 1964) which has increased areas of black pigment generally but lacks melanin on some parts of the head where normal individuals are black.

P. makawai is most like *P. bilineatus* and there cannot, I think, be any likelihood that it is the geographical representative of some other known species, such as *P. subsulphureus*. The difference in curvature of the culmen and apparent width of the bill seem to me not in themselves of great significance as some other forms of *bilineatus* have heavier bills than is usual in *mfumbiri* and a specimen of *P. b. mfumbiri* (British Museum number 1939.10.1.525) from the Didinga Mountains in Southern Sudan has a bill whose size and curvature seems to me similar to that of *makawai*. As, however, specimens of *mfumbiri* taken from or near the type locality of *makawai* all have rather more slender and conical bills, this may well indicate an ecological difference where they overlap. It would certainly be surprising if an aberrantly coloured individual happened also to have a slightly aberrant bill.

The differences of colour pattern between *makawai* and *mfumbiri* are certainly more striking than those between *bilineatus* and *subsulphureus* in some areas where these latter species overlap. Moreover, and I think this may be important, this difference is most obvious if a specimen of each is held and viewed head-on when the white sub-ocular stripe of *mfumbiri* which continues over the base of the upper mandible, its white throat, greyish breast and white superciliary stripe give it an appearance very different from that given by the black forehead and throat, separate sub-ocular stripes and yellowish-white breast of *makawai*. It seems probable that this difference could function as an isolating mechanism as there is abundant circumstantial evidence that the coloration of the head and upper breast of birds is often of primary significance in this respect.

I conclude, therefore, that *makawai* is best considered as a new species, at least provisionally. Further confirmation of its status is, however, desirable. It would be interesting to discover if there are vocal differences such as there are between the calls, or at any rate the known calls, of *bilineatus* and *subsulphureus* (Chapin 1939, Young 1946).

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The nesting habits and eggs of the Rufous-tailed Weaver, *Histurgops ruficauda* Reichenow

by Myles Turner and Charles R. S. Pitman

Received 6th August, 1964

On 23rd May, 1946, N. R. Fuggles-Couchman of the Tanganyika Agricultural Department obtained 17 miles south-west of Arusha c/3

Histurgops ruficauda which measured 27.9 x 18.0, 28.2 x 17.9 and 28.3 x 18.0 mm. and were pale blue marked streakily, and with scribblings, elongated spots and a few blotches of sienna, with grey-mauve undermarkings. This was the first time eggs of this species had been collected and described. The nest was 12 feet above the ground, in a clump of gall acacias in scattered tree grassland.

Previously, Fuggles-Couchman and H. F. I. Elliott (1:344–45), on 28th June, had found nests with young near Monduli, in gall acacias in scattered *Acacia-Balanites* woodland on the Serengeti plains. The nest—there were one to three nests in each acacia—placed in the thorny branches, is described as a large grass ball, with a short side entrance spout 4 inches long and of similar diameter. The nests are usually 5 to 10 feet above the ground and were constructed of several species of grasses, including *Pennisetum straminium*—which constituted the bulk of the structure, *P. mezianum*, *Themeda triandra*, *Urochloa nubica* and some *Sporobolus* spp.; there were a few feathers in the lining. This large weaver was observed in flocks of 8 to 12 birds and sometimes in association with *Agapornis fischeri*. It feeds on the ground and has a bleating "pchweezzee" call. Its diet is mixed and includes grass and tree seeds, grains of wheat when available, small insects and locusts.

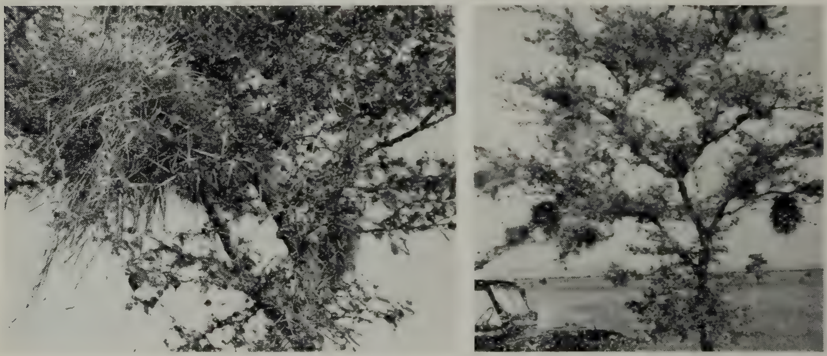
Thanks to investigations carried out by Myles Turner, a member of the Tanganyika National Parks staff, during the past few years in the Serengeti National Park, it is now possible to record in greater detail more of the habits, behaviour and breeding of this little-known weaver.

The Rufous-tailed Weaver is, in fact, one of the commonest weavers found in the Serengeti National Park in Northern Tanganyika. According to (3:866) Praed and Grant (1955) "prefers wooded hills", which is wrong, at least in the Serengeti habitat, where *Histurgops* is not found around hills or in thick bush, but is a bird of the open grassland. Its general colour is brownish with tawny flight feathers and the very noticeable chestnut coloured patch on the rump and the rufous tail are conspicuous when the bird takes off. Wing measurement averages 125 mm.

It occurs in flocks of up to 25 birds and can often be seen feeding in noisy parties, all alighting on the ground and making short flights forward to land again. In longish grass the birds are very easy to approach when feeding and they have a particularly slow take-off.

NESTING

Nests of this weaver are constructed in large untidy "clumps", up to 30 nests in a tree, in the "umbrella thorn", *Acacia tortilis* which abounds throughout the Park, and where they are not readily accessible. But by far the commonest nesting grounds and the easiest to examine are in the great "gol" (gall) acacia, *Acacia drepanolobium* thickets which occur in the western corridor area of the Park near Lake Victoria and also in the Central Mbalageti Valley. This acacia, commonly known as the "whistling thorn" grows to a maximum height of about 14 feet and sometimes extends for miles in swampy areas. Up to 20 *Histurgops* nests can sometimes be easily examined in one tree by standing on the roof of a Land Rover. From Turner's observations, building by *Histurgops* goes on practically all the year round accompanied by the usual frantic activity and noise so typical of weavers. Pitman was able to observe this in September, 1961, when, in the middle of a fine day prior to rains, he found a colony in which about a dozen nests were occupied, several being built, on the pendant branches of an *Acacia tortilis* and from which an unexpected number of birds "exploded"; they had not returned an hour later. From the top of a lorry it was possible to ascertain that the nests contained no eggs as was only to be expected for all the nests had two entrances. The nest, as seen in the photographs, is a large untidy structure, about 18 x 9 inches in size, made of coarse grass, mainly bamboo grass, *Pennisetum mezianum* and with an entrance at either end. It is often cylindrical in shape and up to six nests are sometimes joined together in an untidy clump. In the nests Turner examined which contained eggs of the Superb Starling, *Spreo superbus* Ruppell, he could not understand how the eggs managed to remain in these nests, because of the two entrances, one at each end as it seemed impossible that eggs would not fall out when the tree was blown by the wind. Prior to September, 1962, Turner had come across only four eggs out of a total of some 300 nests examined. On 7th January, 1964, in the Handajega area he inspected 57 nests and collected seven eggs which turned out to be those of the Superb Starling. Apparently these starlings use the hundreds of abandoned and unoccupied *Histurgops* nests for breeding. Also, at the same time he observed large numbers of Fischer's or Orange-faced Lovebird, *Agapornis fischeri*, exploding out of nests when disturbed by day and flying into them in the evening. These lovebirds seem to use the nests as roosting places, as so far Turner has found none of their eggs. According to (2:552–53) Praed and Grant (1952) this lovebird "is also said to make or use oval nests and close up the entrance with thorns". On 14th January, 1964, Turner moved further west to the Nyakaromo area and after examining about 80 nests collected 20 *Histurgops* eggs. In one acacia examined, containing 14 nests, were found: one nest with 3 eggs; another with 3 *Spreo superbus* eggs; a third contained two fledgling *Histurgops* nearly ready to fly; and two half built new nests with birds building. In February, 1964, more *Histurgops* eggs, were collected as the first consignment for the British Museum (Natural History) were damaged during transit.



Photographs : Myles Turner

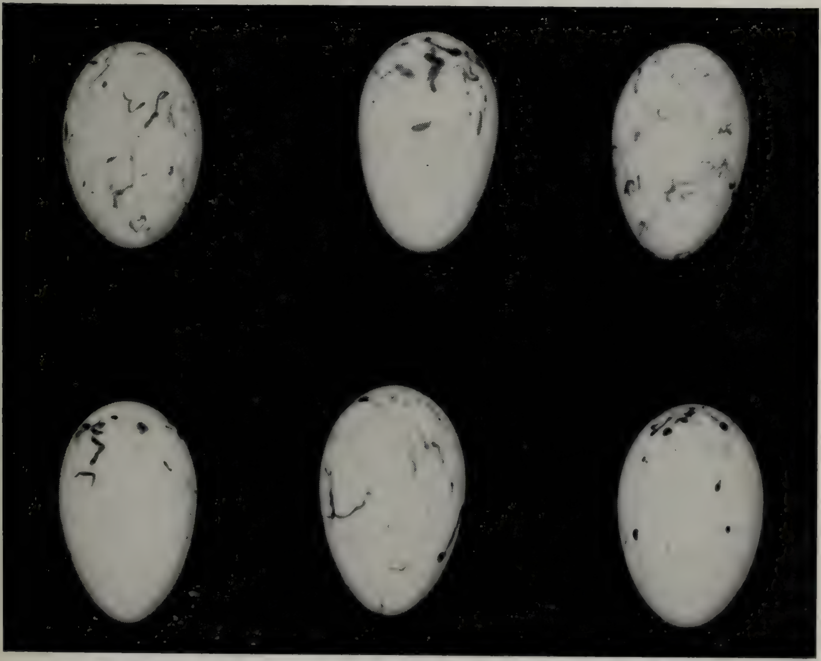
Nests of *Histurgops ruficauda*

All nests containing eggs have only *one* entrance, as before eggs are laid one of the entrances is closed. Clutches of eggs are never more than 3 and sometimes only 2; single eggs presumably represent incomplete sets. The interior of the nests he examined contained no lining, neither feathers nor padding, and the eggs rested on the grass shell. *Histurgops* roosts in these great nesting colonies all the year round and the "double entrance" nests are doubtless built this way to facilitate entry and exit. January, February and March are the main breeding months. Turner's photographs depict the untidy *Histurgops* nests in a "whistling thorn", as well as the grassland habitat.

According to Turner, a large grey hawk has often been observed "bullying" these weavers, and he has seen this predator raiding a colony and tearing at the nests. He was under the impression that both species of Chanting Goshawk, *Melierax poliopterus* Cabanis and *Melierax metabates mechowi* Cabanis, which are common in the Park, are the culprits; but it is more likely to be the Harrier Hawk or Gymnogene, *Polyboroides typus* Smith, its propensity for raiding weaver colonies being a well-known characteristic.

EGGS

There is little variation in the coloration or markings of the eggs, which are smooth without gloss and inclined to be elongate. The ground colour is very light to pale blue and the markings—long streaks, scrawls, scribblings and spots—are either scattered sparingly all over the egg or have a tendency



Photograph : Myles Turner

Eggs of *Histurgops ruficauda* (actual size) to become thicker at the large end or to form a wreath around the top of the large end. The markings, which vary from black to sepia and brown on underlying shades of grey and slate-grey, are rarely discrete. The illustration shows how little the markings vary.

Twenty-one eggs average 27.3 x 17.3 mm., with a measurement range 25.3–29.0 x 16.5–18.3 mm.

SUMMARY

The habitat of the Rufous-tailed Weaver, *Histurgops ruficauda* of Tanganyika is described.

Habits, behaviour, call, abundance and flock size are all mentioned.

There are details of the eggs and nests; favourite nesting trees are identified, as are also the grasses of which the nests are composed.

The Superb Starling, *Spreo superbus* lays in the old nests of *Histurgops*, in which quantities of the Fischer's or Orange-faced Lovebird, *Agapornis fischeri* also commonly roost, both by day and night.

Nest colonies are occupied by *Histurgops* throughout the year but the breeding season is brief.

A large grey hawk has often been seen harrying the *Histurgops* colonies.

ACKNOWLEDGEMENT

We gratefully acknowledge the permission of the Trustees and the Director of the Tanganyika National Parks for the publication of this paper.

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An ecological investigation of the Giant Pied-billed Grebe, *Podilymbus gigas* Griscom

by ANNE LABASTILLE BOWES

Received 2nd August, 1964

One of the rarest waterbirds in the Western Hemisphere is the Giant Pied-billed Grebe, *Podilymbus gigas*, of the Guatemalan highlands. The species occurs only on Lake Atitlan (1555 metres) and numbers no more than an estimated 200 individuals.

The author and her husband, C. V. Bowes, Jr., became interested in these grebes during several Guatemalan trips in connection with their Caribbean Wildlife Tours. It was soon evident that local residents were ignorant about the species and that the birds were subject to shooting, egg-stealing and some natural predation. Nothing could be found on its life history, nor had there been any mention in the literature since 1936.

Consequently, in March, 1960, the Bowes, Jr., with Jorge Ibarra, Director of Guatemala's Museum of Natural History, and Father Juan Manuel, priest of Panajachel, spent four days censusing and photographing the Atitlan grebes by boat. A total of 99 birds was seen along the more than 100 kilometer shoreline. We believe that twice this number were actually present on the lake, indicating the population had remained fairly stable since Griscom's count of 100 pairs in 1930 and Wetmore's of 1936.

Although the Giant Grebe was collected by Salvin and Godman in 1862, the bird was not recognized as a distinct species until 1929. Griscom and Crosby named it and made the first population estimates. Wetmore (1941) corroborated these findings in 1936. In October, 1962, the *Auk* carried a General Note by the present author.

In May, 1963, we received a grant from the International Council of Bird Preservation and the World Wildlife Fund with which we spent one month of intensive study at Lake Atitlan. The investigation was based on description and measurements, food habits, non-reproductive behaviour, reproductive behaviour, limiting factors and conservation education.

DESCRIPTION AND MEASUREMENTS

The original ancestor of the Guatemalan grebe was undoubtedly that of *Podilymbus podiceps* (L) a widespread polytypic species. Today the two species are entirely allopatric. The Giant Grebe still resembles *P. podiceps*, but it is nearly twice the size; its wings are small and weak, coloration is darker and the pied mark is distinctly black on a large white bill.

Weights and measurements of three Giant Grebes

	Juvenile female (*age* 4 *to* 8 *weeks*)	*Adult female*	*Adult male*
Weight	236.0 grms.	584.0	804.5
Wing length right	240 mm.	267	283
Bill, culmen to base	21 mm.	21	25
Tail	45 mm.	45	50
Mid toe with claw, right	54 mm.	67	80
Tarsus, left	32 mm.	42	48
Total length	385 mm.	457	525

Juveniles are greyish-brown with indistinct pied marks. Bellies are silvery-white with grey flecks on sides; backs are much darker brown.

Unborn chicks close to hatching are almost black with 3 or 4 longitudinal stripes of white running down back, from head to tail. Belly is lighter brown and streaked. Pied mark is distinct on a stubby whitish bill. Lores are pink.

Food habits

The Atitlan grebe is primarily a fish eater. It feeds during early morning and late afternoon in beds of *Chara*, *Potamogeton* and *Eichornia* which grow close to the precipitious shoreline. Of 35 timed dives, both sexes averaged 20 seconds under water. Stomach contents of four specimens included small fish (grebes can accommodate fish up to 15 cm. long), balls of feathers, pebbles (one of pumice), a snail (1½ cm.) and insect remains.

Potential food fish in Lake Atitlan are:

**Cichlasoma nigrofasciatum*=zebra-backed cichlid
Cichlasoma sp.=3 species of mojarras
Tilapia mossambica=tilapia
Mollienisia sphenops=pescadito
Profundulus guatemalensis=gulmina=characin
Astyanax sp.=pepesca=killifish
Poecilistes sp.=pupo=top minnow
*one record exists of this fish found inside a grebe.

When a bird catches a fish, it immediately looks around and swims for deeper water. This seems to be a safeguard against food-snatching, a common practice among mates and juveniles. We also observed a young grebe pecking at *Typha* stalks where aphids and dried-up helgrammite cases were attached. Other possible food items could include dragonflies and other insects, leeches, water spiders and crabs (*Potomocarcinus guatemalensis*). No pellet casting was noted in wild or captive birds.

Non-reproductive behaviour

A special effort was made to determine whether the grebes are capable of flight. During a total of 150 hours observation, we saw birds run across the water, flapping their wings violently, but never becoming airborne. We named this ''Patter-flight''. Upon dissection of the pectoral muscles, it was found that *P. major* was well-developed while *P. minor* was small. The ratio averaged 8:1 in grams. Adult grebes weigh between 500 to 900 grams usually, yet their wings are small. The total wing area of an 805 gram male was 414 sq. cm. The author concluded on the basis of field observations plus laboratory data that Giant Grebes are not normally capable of flight. Against a strong wind, it is possible that a bird might briefly fly.

The species swims and dives with ease. The farthest distance covered underwater was 100 meters. Females showed a tendency to submerge sooner than males when alarmed. Excellent control of their specific

Male Giant Pied-billed Grebe giving territorial call.

gravity allows the birds to float at whatever level they choose. One juvenile however, had trouble in staying under water. Five types of dive were noted: working, alarm, power (aggressive), patter-plunge (escape) and ducking (courtship).

Non-breeding birds spend most of the day sleeping and preening in the shelter of waterweed, reed or cat-tail beds. This vegetation effectively breaks the rough waves which begin after mid-day due to strong mountain winds.

The sleep position, as described by Simmons (1955), is the ''pork-pie'' attitude.

The calls of these waterbirds are varied and often lead one to a direct diagnosis of their reproductive state. Five different vocalizations were heard: ''Pok'' (announcement call), ''Creaking pump groan'' (location call), ''chu-chu'' (advertising), ''hen-flicker'' (recognition chatter between mates), and ''gulping cow'' (territorial call). The latter two were taped and sent to Cornell's Laboratory of Ornithology. During full moon, we spent all night in our boat and heard considerable vocalization by paired birds.

Reproductive behaviour

Observations were made on three separate groups of grebes, each in different stages of breeding. The birds are loosely colonial and build their nests and platforms in the densest stands of *Typha* and *Scirpus* available. One single pair in early courtship stages occupied an area 3 km. long and ½ km. wide along rocky shores with only two skimpy reed beds. Normally, courting pairs have a territory about 200 m. along the shoreline and extending 50 to 100 m. out into deep water (7 m.). Beyond this ''line'' no territorial disputes were ever observed.

''Forward Threat'' display (after Simmons) was a common form of mild aggressive behaviour, while ''bridling dog'' display was more intense. This might last for five minutes, during which time the two males would pivot, preen, bridle and puff along their invisible boundary line.

''Swimming together'' (after Simmons) was noted very often between mated grebes as were body-shaking and head-shaking. Unfortunately, we were unable to see any platform building, soliciting, copulatory or nest-relief behavior due to the density of reed-beds and wariness of the grebes.

A number of platforms were found, usually after hearing continued ''hen-flicker'' calls from one location. Often, two were placed within 50 feet of each other. Aquatic weeds, dead reed stalks and cat-tails were utilised, yet construction was slipshod. Platforms measured about 30 cm. across and stood only 3 or 5 cm. above water.

Despite a most thorough search along the shoreline, only one nest was found. The birds themselves gave us a clue because of their systematic feeding routine, extreme wariness and continual territorial calls by males.

The nest was located about 70 m. from shore in 2 m. of water. It was built around a stout reed stalk and had a diameter of 38–40 cm. Height above water was 13 cm. The structure was solidly built of various aquatic vegetation and contained five eggs in its shallow depression. This is the first report in the literature.

The eggs were odourless, oval, smooth and stained a dull, mottled brown. They measured 51 mm. long, 33 mm. wide with a circumference at the middle of 102 mm. The clutch was discovered on 2nd May and appeared to be 14 to 20 days old. The oldest egg contained a downy chick within 2 to 4 days of hatching.

From this find and reports of two or three conscientious residents, grebes have been seen with eggs or downy young on the following dates:

May 2	5 eggs near hatching
June, late	2 chicks on parent's back
Dec., early	4 chicks with 2 adults
	2 chicks with 1 adult
April 4	6 chicks with 3 sets of parents

It seems likely that two peaks exist in grebe reproduction, namely Nov.-Dec. and April-May-June. It is also possible the birds could nest at any time of year, as is the case with *Podilymbus podiceps* in Cuba (Gross, 1949).

A pair of Giant Pied-billed Grebes resting in patch of water weeds (*Chara*, *Potamogeton*, etc.)

During this investigation, we had the opportunity to capture two juvenile birds, aged 4 to 8 weeks and 2 to 4 months. This gave us the chance to note plumage, behaviour and vocalization. Unfortunately, both died within four days of spasms, convulsions and strangulation. It is assumed they were suffering from hypovitaminosis. Perhaps our diet of raw fish did not supply the needed vitamins, or supplied too much thiaminase which can lead to severe enzymatic disturbances (Suomalainen and Philgren, 1955). Both birds were very emaciated upon capture.

Limiting factors

Natural threats are few since mammalian predators are rare in the lake basin and birds of prey and snakes are scarce. Most dangerous to chicks, juveniles and adults are the small- and large-mouth bass introduced into

Lake Atitlan in 1957. From local reports plus the condition of our two young grebes, the authors believe bass are serious predators on the downy chicks and compete directly with juveniles and adults for food. Bass of seven pounds are not uncommon and their predatory nature is well recorded. The author examined 18 bass intestines and found small fish, crabs, leaves and beetle larvae.

The second greatest peril to the grebes comes through human predation and interference. Indians often shoot the birds with sling-shots and steal their eggs. Resident and visiting "sportsmen" also hunt with shot-guns.

Other limiting factors include reed cutting by Indians which reduces nesting and cover sites, real estate development, motor-boating and changes in water level. We feel it is remarkable that the grebes are surviving under the present increasing threats of bass and humans. Indications are that the birds are declining in numbers.

Conservation education

Despite the recent establishment of a waterfowl refuge on Lake Atitlan by the Guatemalan Government, in January, 1959, hunting and molestation of the grebes continue. During our March, 1960, census of birds, we stopped in five Indian villages to explain the rarity and the need for conservation. This programme was continued during the present investigation. New posters were printed and erected, a radio tape in four languages was prepared for broadcast and a number of television and press releases given.

Six specimens and five eggs (nest was deserted) were collected and sent to various scientific institutions. A short colour film and many photographs were taken. An estimate and plan for year-round protection of grebes was submitted to the International Council for Bird Preservation and to Carlos Humberto de Leon, Minister of Agriculture in Guatemala.

If funds could be found, we believe the Guatemalan Minister would co-operate fully with game wardens and equipment. Twelve hundred dollars would cover four wardens during the four peak reproductive months and permit the services of a biologist for one or two months a year. We are convinced that the Giant Grebes are declining in number and need immediate protection. There is ample room for further scientific investigation, conservation enforcement and education. Every effort should be made to save these rare waterbirds.

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Two notes on *Carduelis*

by Collingwood Ingram

Received 5th September, 1964

ALBINISM IN THE REDPOLL

In regard to R. E. Scott's paper describing an instance of partial albinism in the Redpoll (*Carduelis flammea*) the following fact may be of interest. My father, who was a keen aviculturist and at one time possessed a unique collection of albino birds, once owned a wild-caught example of this species that was entirely white save for the crown of its head which was of a pale coppery hue where, in the type, it would have been red.

SISKINS FEEDING ON SEEDS OF EUCALYPTUS

In Andalucia the Siskin (*Carduelis spinus*) is a very uncertain winter migrant: in some years it is abundant and in others not one is to be seen. Indeed its visitations might be likened to the "irruptions" of Waxwings (*Bombycilla garrulus*) in England; they are equally unpredictable and, apparently, are likewise in no way connected with immediate climatic conditions. Its numbers, at any rate, do not necessarily increase as do those of Lapwing, Song Thrush, Robin and Skylark during exceptionally cold spells in northern Europe.

In the winter of 1961–62 there was a big invasion of Siskins into the coastal regions of southern Spain. Near Guadalmina a flock of 30 or 40 could regularly be observed on a roadway that passed under an avenue of tall eucalyptus trees (*E. rostrata*). The birds went there in order to feed on the minute seeds of this antipodean tree, large quantities of which had been shed on to the road's surface.

An early record of the Masked Shrike in Spain

by C. J. O. Harrison

Received 30th September, 1964

The Masked Shrike, *Lanius nubicus* Lichtenstein, breeds in Asia Minor and in Greece, and migrates into east and central Africa. It rarely occurs further west. Etchécopar and Hüe (1964) record only one North African occurrence, at Philippeville, Algeria, in April. Mountfort (1958) records two sight records on the Coto Doñana in southern Spain in May, 1956, and states that the species had not been recorded before in Spain, but mentions that Howard Saunders thought he saw one at Gibraltar in 1873.

When a collection of skins and mounted birds made by the late Lt.-Col. H. C. Wade-Dalton, and housed at Hauxwell Hall, Leyburn, Yorkshire, was examined recently it was found to include a skin of a Masked Shrike, collected with other birds at Gibraltar in 1883. The identification was subsequently confirmed by comparison with material in the British Museum (Natural History). The bird was sexed as a female, and the plumage showed many immature characters suggesting that it was a first winter bird. It was collected at "Convent, Cork Woods, Gibraltar" on 12th January, 1883. This would appear to constitute the earliest substantiated record of its occurrence in those parts.

References:
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Mountfort, G. 1958. *Portrait of a wilderness.*

CONTRIBUTORS

Contributions are not restricted to members of the B.O.C. and should be addressed to the Editor, Mr. John Yealland, The Zoological Society of London, Regent's Park, London, N.W.1. These should be concise and typed on one side of the paper, double-spaced, with a good margin. The first time a species is mentioned, the scientific generic and specific names should be included. Subsequently the same name need only have the initial letter of the genus. Scientific names are printed in italics and should be underlined in the typescript. References should be given at the end of the paper.

Authors introducing a new name or describing a new species or race should indicate this in their title and display the name prominently in the text followed by *nom. nov., sp. nov., subsp. nov.* as appropriate. In these descriptions, the first introduction of the name should be followed by paragraphs for "Description", "Distribution", "Type", "Measurements of Type", "Material examined" and further sub-headings as required.

Proofs must be returned without delay. No changes may be made at this stage, other than corrections. At the discretion of the Editor, the Club will pay for a reasonable number of monochrome blocks, which the contributor may retain for his own use.

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DINNERS AND MEETINGS FOR 1965

19th January, 16th February, 16th March, 20th April (A.G.M.), 18th May, 21st September, 19th October, 16th November and 21st December.

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The six hundred and twenty-second meeting of the Club was held at the Rembrandt Hotel, London, on 19th January, 1965

Chairman: Major-General C. B. Wainwright

Members present 14; Guests 4.

Mr. T. W. Gladwin spoke on migratory weight changes in wablers. A summary will be published in the *Bulletin.*

The Pygmy Honey-guide, *Indicator pumilio* Chapin in East Africa

by John G. Williams and Herbert Friedmann

Received 26th October, 1964

The geographic range of the Pygmy Honey-guide, *Indicator pumilio*, was stated as recently as 1962. by Chapin (*Ibis*, vol. 104, p. 43) to be the highlands west of Lake Edward and Lake Kivu, at levels between 6,000 and 7,800 feet, from near Mt. Tschabirimu and the North Talya River, close to the equator, south as far as the highlands north-west of Lake Tanganyika, the southermost records being from the Itombwe highland, at almost 4° S., from Nikenge, Luiko and Kakanga. The object of the present note is to report an eastern extension of this distribution to the Impenetrable forest, s.w. Kigezi, 8,000 feet, Uganda, where a female was collected by J. G. Williams on 27th April 1964, and even to the Kakamega forest, 5,500 feet, western Kenya, where A. Forbes-Watson obtained another female on 20th March 1963.

These two specimens were compared by H. Friedmann with two examples of *pumilio* collected by J. P. Chapin west of Lake Kivu, and were found to be definitely of the same species. The Kigezi bird is practically identical with those from Tshibati, Kivu district, but the one from Kakamega is sufficiently different to raise the question as to whether or not it may represent an as yet undescribed race. It is a trifle larger, with a wing length of 70 mm., as compared with 64 mm. in the Tshibati and Kigezi birds (Chapin did, however, give 69 mm. as a maximum for female *pumilio* from the eastern Congo). It also has the under parts more uniformly greyish, without the streaks present in the Congo and western Uganda birds, and has the entire top and sides of the head more greyish.

less greenish, less streaked than in the more western examples. There is a noticeable contrast in the general tone of the top of the head and of the back in the Kakamega bird which is not present in the others. Additional material from Kakamega will be required to permit any decision as to the possible distinctness of the population there.

When Chapin discovered *I. pumilio* and described it in 1958, it came as a surprise that there was a small, long overlooked species sympatric with *I. exilis*. When he later (*Ibis*, 1962, pp. 40–44) elucidated the status of still another small, superficially similar honey-guide, *I. willcocksi*, even more extensively sympatric with *I. exilis*, it became apparent that our knowledge required much re-evaluating. To find now that *pumilio* has a discontinuous distribution east as far as the Kakamega forest of western Kenya serves to accentuate still more the realization that there are still discoveries to be made in areas assumed to be well known.

A presumed trigen duck involving Mallard, Pintail and Gadwall

by James M. Harrison and Jeffery G. Harrison

Received 12th October, 1964

INTRODUCTION

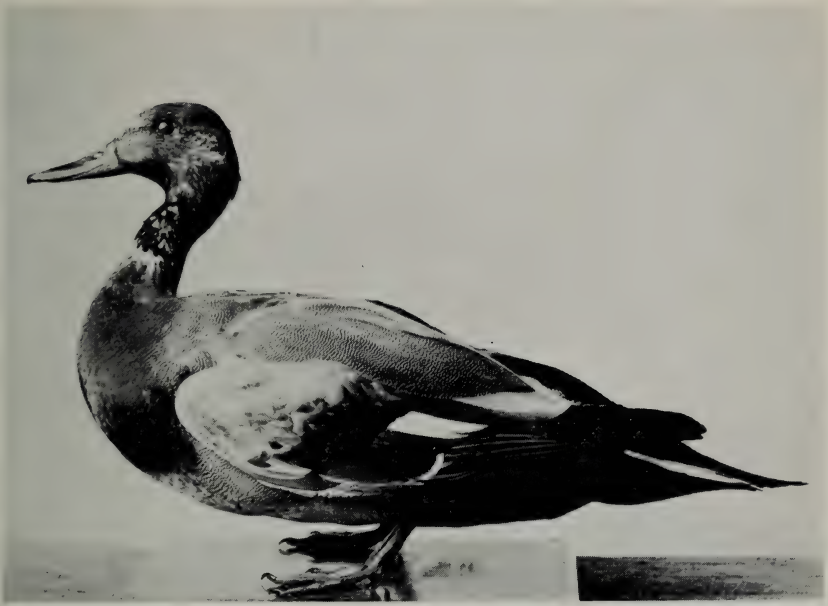
On 28th December, 1963, a remarkable hybrid duck was shot at Dersingham, Norfolk, by Mr. J. Ellis of Worksop. The bird, a drake by plumage, was single and was shot at dawn as it was flighting out to sea.

Mr. Ellis made a most astute guess at its identity, namely that it was a trigen involving Mallard *Anas platyrhynchos platyrhynchos* Linnaeus, Pintail *A. acuta acuta* Linnaeus and Gadwall *A. strepera* Linnaeus. He had the bird mounted and later very kindly loaned it to us for study and we are able to support his identification.

To the best of our knowledge this is the first example of a presumed trigen duck occuring in the wild, while, of course, it is known that Mallard X Pintail hybrids are fertile and that all three species are found nesting in Norfolk.

The term trigen was introduced by the late J. L. Bonhote (1905) when a nomenclature was being sought to express individuals of multiple genetic constitutions, and at the suggestion of Professor Skeat a simple interspecific cross was termed a digen, and where more than two species were involved the individual was designated as a trigen, tetragen, pentagen and so on, according to the number of species concerned.

Before describing the present specimen it would be well to quote from Bonhote's paper (*loc. cit.*) as to the different varieties which hybridisation can produce. Such individuals can bear (1) resemblances to one or other of the parent species or (2) they may produce variations resembling species other than those involved in the parentage, or (3) individuals resembling no known species, or again (4) white coloration. A frequent variation can be recognised as being more or less intermediate in character between the parent species. Broadly speaking the interpretation of a simple interspecific hybrid presents little difficulty, but as the genetic constitution becomes more complex, the resulting morphology concomitantly becomes more obscure.



Photograph: Pamela Harrison

Presumed trigen Mallard x Pintail x Gadwall

DESCRIPTION

UPPER PARTS:

Back adjacent to neck: brownish-grey, finely though indistinctly vermiculated sepia.

Mantle: a triangular area of warmish-brown, feathers broadly edged paler warmish-brown.

Lower back: much as mantle, but paler.

Rump: as lower back, but a shade darker.

Upper tail-coverts: blackish-sepia, central pair elongated into a short "pin", a few feathers faintly warmish-brown.

Rectrices: central pair elongated, greyish-sepia, rest pale beige patterned rather as in a ♀ *A. platyrhynchos*, with brownish and whitish oblique, somewhat arrow-shaped markings with the points directed towards the tip of the tail. One outermost on left side is finely vermiculated greyish and whitish. Tips of all rectrices pale.

UNDER PARTS:

Breast: strong chestnut, on sides showing somewhat obscured but heavy barring; centrally a series of obscured spots, small bars and smaller arrow-heads. The spots are rather similar to those seen on the breast-shield of drakes of *A. p. conboschas*, and the small arrow-heads could represent very modified crescents as on the breasts of drake. *A. strepera.*

Lower breast and upper belly: whitish with some bay suffusion, heavily spotted with dark sepia; lower belly and vent greyish, due to fine and close vermiculations.

Under tail-coverts: rich black.

Rectrices: pale sepia, tips lightish.

Flanks: whitish, vermiculated in grey.

Wing: (*upper surface*)

Coverts: near Isabella (Ridgway, Pl. iii., 23), feathers edged paler. Some median and all greater coverts broadly and variously edged blackish and faint to strong chestnut.

Speculum: innermost part whitish tipped blackish, middle part strong green, rest blackish. Lower edge of speculum finely edged white. Foreedge of wing white, mottled ''Drab Grey'' (Ridgway, Pl. ii, 13), and white.

Scapulars: innermost and median ''Bistre'' (Ridgway, Pl. iii., 6), some uniform, others finely vermiculated in sepia. Longest, ''Drab Grey'' (Ridgway) uniform, somewhat paler at edges.

Primaries and secondaries: sepia darker on tips and outer vanes.

Wing (under surface) axillaries white, under wing-coverts white, tipped faintly grey; rest of under surface of wing pale grey.

HEAD AND NECK:

Forehead: a pale area lightly speckled sepia, extends for 18 mm. from feather margin at base of bill.

Crown: dusky chestnut with dull purple reflections, barred sepia.

Nape: lighter and somewhat brighter chestnut, almost uniform.

Back of neck: dark chestnut with some streaking of dusky metallic green.

Lores: as forehead, but from base of bill a chestnut loral stripe (incomplete on left side).

Cheeks: strong chestnut, finely striated sepia anteriorly; below loral stripes whitish, striated finely with sepia. Posteriorly, a whitish area striated sepia with dull greenish reflections. This broad pattern is to be regarded as a variation of the bimaculated pattern seen in other duck hybrids. (Harrison, J. M. and J. G., 1963).

Sides of neck: a broad dark bluish-black band measuring 38 mm. encircles the neck; below this is an incomplete and narrow white ring, most strongly marked anteriorly.

Chin and throat: dusky greenish-black.

Soft parts: not recorded (but artificial eye brown).

Tarsi and toes: dull yellowish, webs and nails dusky.

Bill: this would appear to have been darkish.

MEASUREMENTS (in mm.)

Wing:	275
Bill:	
Length:	47
Width at nostrils:	19
Width at widest point:	19.5
Tarsus:	48.5
Middle toe with nail:	54.5
Tail:	120

DISCUSSION

Any discussion on hybrids, particularly when they are of unknown parentage, must involve some speculation. Notwithstanding this, the study of such material, which has been sadly neglected in the past, may well disclose underlying biological principles of great interest. Bonhote, in his paper already referred to, based as it was on birds bred in captivity and therefore of known parentage and age, may be said to have been among the first to have made a scientific approach to the problems involved.

Bonhote found that most of the hybrids discussed in his paper were fertile *inter se* and he noted that the sex ratios on hatching were approximately equal, but that there was a greater early mortality in ducks than drakes. This may be significant in the fact that many more drake than duck hybrids are reported in the wild, although, of course, they are far more easily recognised.

In so far as the trigen duck is concerned, which is the subject of this paper, being wild-shot we have no certain knowledge of its parentage or age. It was not sexed anatomically, but is a presumptive male on plumage. Neither is there any note of any other important anatomical criteria of age and it is unfortunate that the tracheal bulla was not saved for anatomical study, for it has been proved that this structure often provides valuable data. Notwithstanding this, the plumage characters are of extreme interest. In studying the charecters presented by this hybrid, we were fortunate to have a pair of Mallard X Gadwall hybrids on loan from the Carlisle Museum and a drake Mallard X Pintail in our own collection. The following characters in the hybrid support the theory of its trigen constitution:—

Upper parts: the vermiculations of the back are intermediate in character between Mallard X Gadwall and Mallard X Pintail. In both the trigen and the Mallard X Pintail there is a triangular area of the mantle which is a dark brownish-grey colour, which is lacking in the Mallard X Gadwall. On the other hand, the presumed trigen lacks any black edging to the outer vanes of the scapulars as is seen in Pintail and Mallard X Pintail hybrids.

The rump and upper tail-coverts match Mallard X Gadwall, but the central pair of upper tail-coverts are elongated into a short ''pin'', although not as marked as in Mallard X Pintail, nor do these two feathers show any tendency to curl upwards. The underlying pair of central tail feathers are also somewhat elongated in the trigen.

Under parts: the chestnut breast shield is predominantly Mallard, as is seen in varying degrees in different individuals of Mallard X Pintail. The amount of spotting and barring suggests Mallard X Gadwall, but only very vestigial crescentic markings are seen on the breast.

Wing-coverts and speculum: those of the trigen are virtually indistinguishable from Mallard X Gadwall.

Head and neck: these tend to resemble Mallard X Gadwall, particularly in the blue-black coloration of the neck anteriorly, which is also present as a strong patch of colour in the drake Mallard X Gadwall (Harrison J. M. and J. G., in press). The narrow whitish neck ring is intermediate between that of the Mallard X Gadwall, which is buff, and that of the Mallard X Pintail, which is white. The cheeks are strongly chestnut, as we have described in some Gadwall drakes (Harrison J. M. and J. G. 1963.) The dull purple reflections on the crown and the greenish reflections on the cheek behind the eye support the influence of Pintail and Mallard respectively.

SUMMARY

A wild shot presumptive trigen duck is described, showing characters which may be attributed to Mallard, Pintail and Gadwall, as well as to hybrid Mallard X Pintail and Mallard X Gadwall. The bird shows a tendency towards the development of a bimaculated facial pattern.

ACKNOWLEDGMENTS

We are most grateful to Mr. J. Ellis for the loan of the trigen and to Dr. Pamela Harrison for the photograph of the specimen. We must also thank Mr. A. Blezard, Keeper of Zoology at the Carlisle Museum for the loan of a pair of Mallard X Gadwall hybrids which are to be the subject of a further paper.

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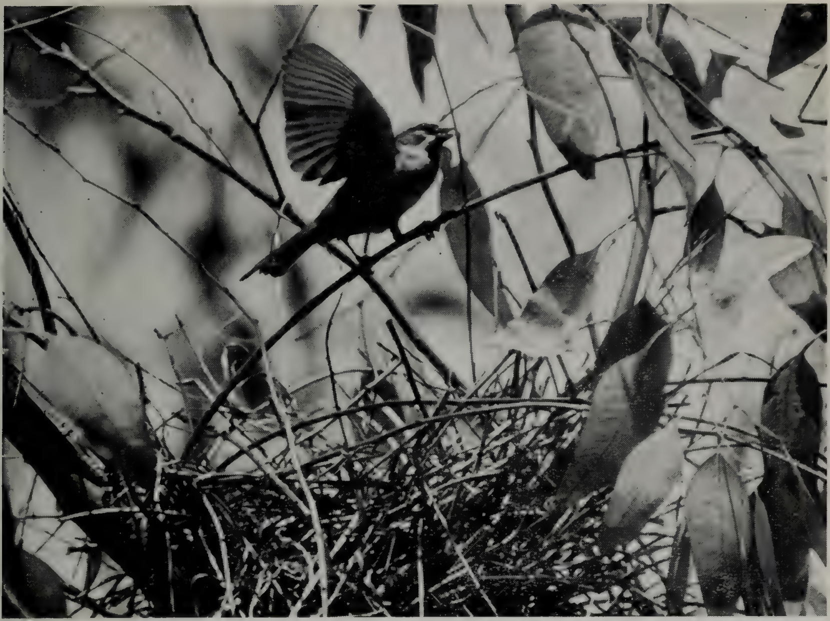
The nest advertisement display as a *Passer*/Ploceidae link

by C. J. O. Harrison

Received 22nd October, 1964

The sparrows of the genus *Passer* were shown by Suskin (1927) to be related closely to the true weavers, Ploceidae, by reason of their structure, but, apart from these morphological affinities there is little obvious indication of relationship. The domed nest sets the sparrows apart from the finches, Fringillidae, with which they were earlier grouped, but Collias and Collias (1964) show that in its loose structure and haphazard arrangement of material the typical sparrow nest differs from the woven nests of most weavers. Behaviourally there is little evidence to link the two groups. More recent studies suggest, however, that the nest advertisement display may reveal a strong ethological link between the two.

This display is very poorly developed in the House Sparrow, *Passer domesticus*, but occurs in a much more striking form in the Dead Sea Sparrow, *Passer moabiticus*. This species was little known, but the Jordan Valley Expedition of 1962, led by Guy Mountfort, to whom I am indebted for permission to use this data, filmed this species among others and the film was shown at the British Ornithologists' Union Conference at Southhampton in 1964. In addition still photographs were taken and I am deeply indebted to Eric Hosking for the photograph shown here and for the opportunity to examine others.



P. moabiticus has a peculiar limited distribution, being confined to the southern end of the Jordan Valley, part of the lower valley of the Tigris, and a third small pocket in eastern Iran. In general appearance it resembles a rather boldly coloured House Sparrow but with a bright yellow area surrounding the bib and on the sides of the neck. The nest is a large domed structure set in a fork in a bush or tree, built of fairly heavy twigs and lined with softer material. In the breeding season the male brings together enough twigs to form a loose shallow cup, which will form the base of the nest, and he then displays on or above this to attract a female. In the intense form of this display the cock perches in a fairly upright posture, with the tail a little raised and partly spread. The head is raised and the wings are spread and lifted: they are raised above the level of the body

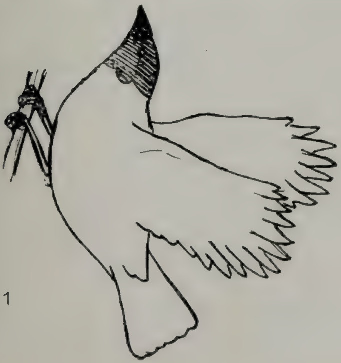


Fig.1

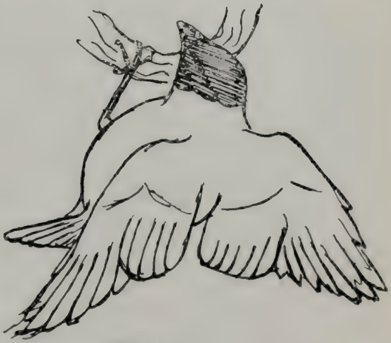


Fig.2

and are rapidly beaten through a limited arc while the bird utters a display call (see photograph). When a hen shows interest in the nest, pairing occurs and the nest is completed.

It is interesting to compare this with the nest advertisement displays of typical weavers such as the Baya Weaver *Ploceus phillipinus* (Crook 1960a) and the Village Weaver *P. cucullatus* (Crook 1962). In each case the male builds the base of the nest and a ring of material on which the nest will formed, but this basis is a pendent structure. The male then clings to this, hanging with its back downwards, and in this position spreads the wings and beats then through a limited arc, while uttering a special call. The tail is fanned and may be horizontal or slightily raised or lowered. The head is usually inclined towards the nest (fig 2). When a female shows interest and accepts the nest it is completed. The pattern is the same as that shown by *Passer moabiticus* but the nest site, and hence the whole behaviour, is inverted. With *Ploceus cucullatus*, when a female arrives the male may fly to the twig she is on and display hanging partly below it (fig 1). In this posture head and tail are raised a little above the mid-line of the body and the posture more closely resembles a mirror-image of the nest advertisement display of *Passer moabiticus*.

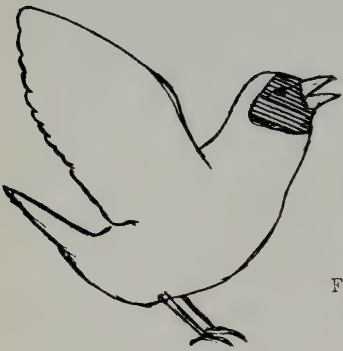


Fig.3

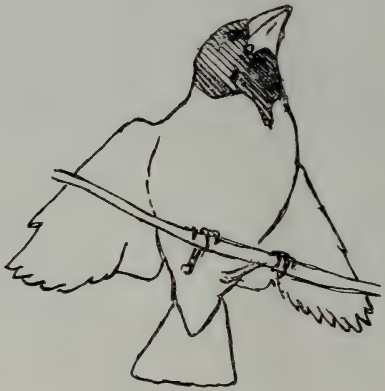


Fig.5

Not all the weavers perform this display in a pendent posture. The Common Quelea, *Quelea quelea*, builds a globular nest between two upright supports. It begins with a cup-shaped base, and having built this displays on it in an upright posture (Crook 1960b). The posture is rather similar to that of *Passer moabiticus* but the tail is tilted sharply upwards and the wings are raised until the tips almost touch and are quivered slightly, but not to any marked extent. The bird may tilt slightly, exposing the white underwing. This is basically the same display but shows specific specialization.

Ploceus cucullatus may show very intense wing-quivering when the female is present (fig 5) and this bears a close resemblance to a posture recorded in *Passer moabiticus* which appears to be a form of this display.

(fig 6). It would appear from these studies that the nest advertisement display of the latter species, and wing-quivering display, can be directly related to similar displays in the weavers of the genera *Ploceus* and *Quelea*.

In his studies of weaver birds Crook recognises several different types of pair formation—in a few species completed before the male leads the female to the nest; in others begun away from the nest but finished there, and in the most advanced social species nest invitation display occurs at the unfinished nest and acceptance of the nest by the female occurs at the commencement of pair formation (Crook 1960b). Crook earlier suggested (1957–8) that the last type evolved from the earlier ones in colonial nesting species in open savannah-type country, although more recently (1962b) he has pointed out that the direction of evolution in the Ploceinae is not established. If Crook's earlier conclusions were correct then the sparrows of the genus *Passer* show this highly evolved type of nest advertisement display although they are not so markedly sociable as the weavers already mentioned, and one must either assume that at some stage they have evolved through similar behavioural patterns, or that they have diverged from the weavers at a point where this form of behaviour had already been evolved. The latter would seem to be the more likely whether this stage of display in weavers is highly evolved or of a basic type. It would be of interest to have more detailed information of the displays of the other genera that are grouped with *Passer* in the Passerinae.

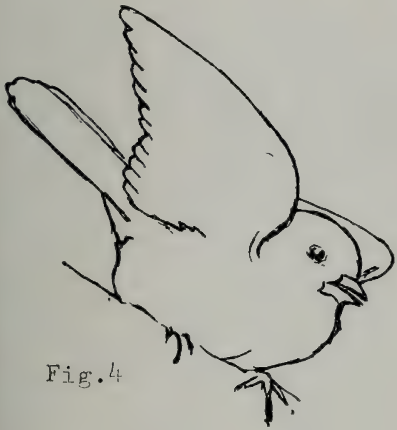


Fig.4

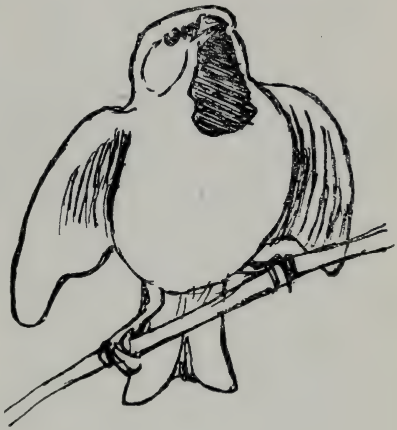


Fig.6

Within the genus *Passer* this nest advertisement display has become modified in different species. In the Golden-headed Sparrow *Passer luteus*, studied by Kunkel (1961), the male gathers a mass of large twigs into a heap in which the nest will subsequently be built. The male displays by this in a crouching position, the body tilted so that the tail is raised.

The body feathers are a little fluffed and the tail partly spread. The male chirps persistently and at high intensity of display the wings are spread and raised a little above the level of the body and shivered in this position (fig. 4). At lower intensities the wings are held away from the body and droop slightly and are shivered in this position. The latter posture is somewhat similar to the wing-quivering displays of *Ploceus cucullatus* and *Passer moabiticus.*

In *P. domesticus* (Summers-Smith 1955) most of this posturing has disappeared and the display has become advertisement calling with a persistently repeated "chirrup". Slight shivering of the wings and raising of the tail only occurs at high intensity on the approach of the female and would appear to be related to the wing-quivering displays of other species. The wing-waving component of the advertisement display appears to have been lost, leaving only the calling. The Tree Sparrow, *P. montanus* (Berck 1961) shows a similar change, the display being a persistant chirping in a normal upright posture, with pairing occurring either near the nest or at a communal roost. This species shows a special fluttering display flight when nest advertising and also possesses other displays (similar to those used by hole-nesting species such as the Nuthatch *Sitta europea* and the Redstart *Phoenicurus phoenicurus*) which have presumably been evolved in response to the hole-nesting habits of *P. montanus.*

The evolutionary trend in these sparrows appears to have been away from domed nests in open bushes or trees and towards nests in niches or holes. The loss of the wing-waving component of the nest advertisement displays appears to run concurrent with this and might well be related to this trend and the needs of a different nest site. The various accounts seem to suggest that loss has been accompanied by an increasing use of the voice in nest advertisement.

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Figs. 1, 2, 3 and 5 are after Crook, (1960b and 1962a) and Fig. 4 after Kunkel 1961.

Notes on variant Whitethroats

by R. E. Scott and J. G. Harrison

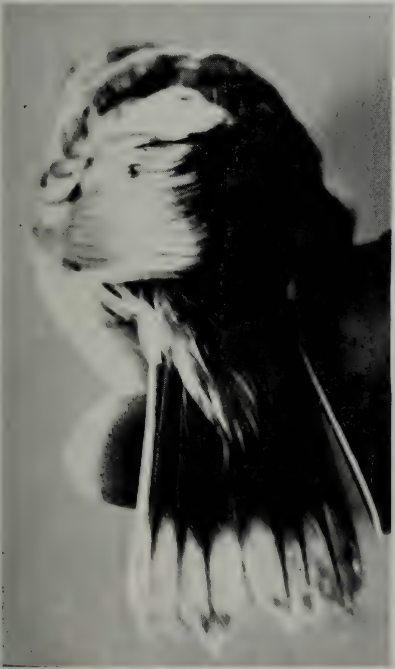
Received 14th October, 1964

Sage (1962) includes the Whitethroat *Sylvia communis* Latham among those species for which albinism has been recorded within the British Isles. Later (Sage, 1963) shows that the seven species of Sylviidae for which he has albinism recorded comprise less than 1% of the total records he had available. Similarly, Glegg (1931) can attribute only one of his 210 Essex records of albinism to the Sylviidae.

During 1964 a total of 543 Whitethroats were trapped at Dungeness Bird Observatory. Romney Marsh, Kent and all examined closely in the hand. Of these only three (or 0.5%) showed any evidence of albinism.

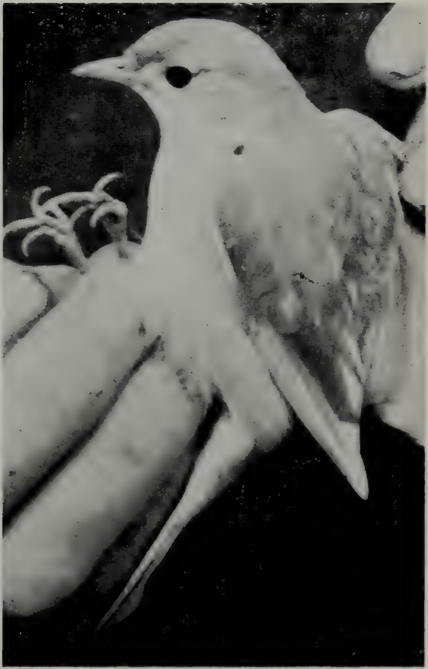
DESCRIPTIONS

A. An adult male trapped on 2nd May, 1964 with an all white terminal band to the tail extending for some 13 mm. from the tip. In all other respects the bird appeared normal. The tail (55.5 mm.) had not completed growth; all twelve feathers were still in sheath at base. Tail lengths of spring male Whitethroats at Dungeness range from 55 to 68.5 mm. and clearly this individual was nearing the completion of its tail growth. All other measurements and weight (14.0 gms. at 0700 hrs. GMT) fell within



Photograph: Pamela Harrison

Whitethroat with white terminal tail band



Photograph: J. Houston

Buff coloured Whitethroat

the expected range of spring males at Dungeness; the bird apparently being in good health.

It would appear that this could be an example of traumatic albinism in view of the fact that the whole tail was still in growth. Apparently the cause of tail loss had additionally damaged the feather buds of the new growth. The bird was ringed: British Museum N 90234; and it will be interesting in the event of a subsequent capture to know if the tail reverts to normal plumage following the post-nuptial moult.

B. A first-winter bird trapped on 10th August, 1964 with a complete lack of all *black* pigment, resulting in a buff coloured individual, with bill legs, feet and claws a pale flesh-pink. The eyes appeared the normal dark brown. Harrison (1963) termed this fawn or buff plumage "aneumelanic". In all respects of measurement and weight (15.5 gms. at 1945 hrs. GMT) the bird was within the range expected for the species and was apparently in good health. The bird was ringed: British Museum N 91300 and released, being seen briefly the following day but not subsequently.

C. An apparently normal first-winter bird trapped on 28th August, 1964 was found to have all its claws paler than normal and a total of four completely white. The bird was ringed: British Museum N 91828.

We are most grateful to Dr. P. F. Harrison and Mr. J. Houston for the two photographs.

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The nest and eggs of the Striped Crake, *Porzana marginalis* Hartlaub

by Charles R. S. Pitman

Received 26th August, 1964

The nest of the Striped Crake is first mentioned by Andersson—*Ortygometra marginalis* (Hartl.), Olive-margined Crake—in *Birds of Damara Land* (1872), pp. 318–320.

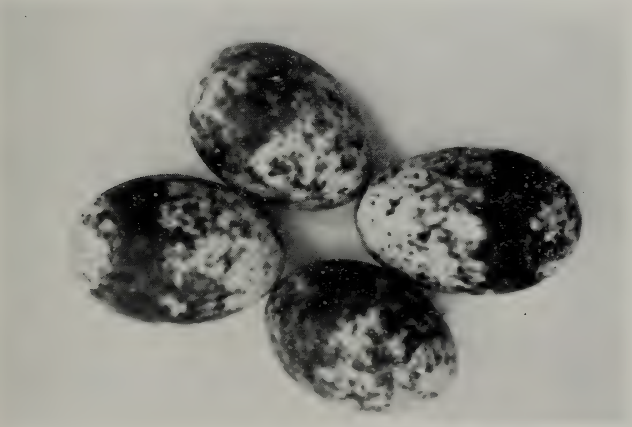
In February and March 1867, Andersson at Ondonga, Ovamboland, collected and observed specimens of this rare crake, as well as obtaining eggs—which he describes "of a yellowish ground-colour almost hidden near the thicker end by a broad zone of light brownish red".

Three females were collected, one each respectively on 6th and 23rd February and on 2nd March. Eggs, as described above, and said to be those of the Striped Crake were brought to him (and also a ♀) on 23rd February; their identity was confirmed by Andersson when, on 1st March, he found a nest containing four similar eggs, situated just on the edge of a marsh, in a dryish tuft of grass; the parent, though not secured was several times observed. The next day, 2nd March, another nest (the third) was brought by a native, with the bird which he had captured upon it, and four eggs. On 26th March, an abandoned nest was found with five eggs, far from the water; it had the surrounding grass tied above it, as in the nest of the Lesser Moorhen *Gallinula angulata* Sundevall. I have been unable to establish whether Andersson's eggs are still in existance.

Austin Roberts (*in litt.*) informed me that in the same locality—at Ondonga—in marshy ground, in May 1937, he saw a Striped Crake which he failed to procure and found its old nest in the marshy grass. As the bird several times flew into this patch he concluded it probably had young ones there.

In Roberts (Revised) ([1]: 104) there are no further original breeding data from South Africa and there is no reference to this crake in Southern Rhodesia by Priest[2] [3], nor yet by Belcher[4] for Nyasaland.

Reports received from various local correspondents from 1953 to 1964 indicate that the Striped Crake probably breeds regularly in Southern Rhodesia during January and February. B. V. Neuby Varty was the first to publish ([5]: 60) the record of a nest, at Marandellas—31st January 1953—which he describes as "a saucer-shaped pad of grass woven into standing grass, about three feet high, in a pool of water, in fact the nest was actually floating on two feet of water." The nest was found when a dog caught the brooding ♀ parent, which was identified at the National Museum of Southern Rhodesia. The eggs measure 33 x 22, 31.5 x 23, 30 x 21.5 and 29.5 x 21.5 mm.; their incubation had commenced. The coloration is described as "very beautiful; the ground colour a pinky-cream with irregular blotches of various shades of rich reddish chocolate coalescing to form an irregular band of a deep dried blood colour which changes to a purplish chocolate at the large end. The underlying, irregular markings of shades of purple, mauve and slate vary considerably in size; there are also small spots."



Photograph: B. V. Neuby Varty

c/4 of *Porzana marginalis*

During fifteen years Neuby Varty has found only three nests, in an area of a couple of hundred acres liable to seasonal inundation, where there is a tufty wire grass averaging about one foot in height. In it there are grassy pools a foot or so deep and from a couple of feet to ten feet in diameter; shortly after the termination of the rains these pools are dry. The Striped Crake has not been observed in the permanent swamps of four to six feet high aquatic vegetation. The first nest was found too late to obtain eggs, the second is the one described and the third a nest which the birds abandoned. Neuby Varty has never come across more than a couple of birds at a time; he is of the opinion from what he has observed that the Striped Crake is inclined to build 'dummy' nests, for some nests are partially constructed and then left. He has not heard these birds utter any call; they appear to be silent. It is possible, with a dog, to flush these birds a second time: in the interests of the birds no attempt was made to flush a third time. They are found in the same sort of habitat as Böhms' Crake (or Fluff-tail) *Sarothrura böhmi* Reichenow, and both species may be found together. The Striped Crake prefers to keep very much to cover and despite its long legs creeps about like a rat; in its habits it resembles Baillon's Crake *Porzana pusilla obscura* Neumann which has been found nesting in the same locality—in a tuft of grass in about one foot of water. Neuby Varty has never seen the Striped Crake out in the open like the Cape Rail, *Rallus caerulescens* Gmelin and the African Crake, *Crex egregia* (Peters),

On 4th February 1952 (Southern Rhodesia Nest Record Card) one egg of the Striped Crake, measuring 28.8 x 22.2 mm., was found by C. T. Fisher on an interwoven platform of sedge leaves nine inches above the water in a clump of sedge in a rice (paddy) field.

On 13th March 1957, Carl Vernon, twelve miles outside Salisbury on the Gwebi Flats, found one egg measuring 30.5 x 21 mm. and two chicks covered in black down with creamy-white ceres, in a shallow bowl (or saucer) of thin grass blades in a grass tuft with the blades meeting above the nest, and sited in a small pan in ankle deep water with a dense stand of thin-bladed watergrass. The sitting bird was caught in the water, beside the nest, where it had taken refuge. The description of the egg is buff in ground colour with red brown and dark brown speckling at the narrow end, the markings becoming larger at the other end where they form a ring of smears; the underlying markings are slaty.

This habitat, similar to that described by Neuby Varty, consists of small pans *i.e.* depressions in open grassland flooded in the rains, seldom deep and with two to three feet high grass. Whenever these pans filled during 1958 and 1960 on the Gwebi Flats, *P. marginalis* attempted to breed, from the evidence of nests seen. c/5 *G. angulata* also was found by Vernon in a deeper part of the same pan as the *P. marginalis* nest in the previous year. During the eleven-year period 1954–1964, G. Hopkinson has found four *P. marginalis* nests within 2½ miles of the centre of Salisbury, but in a fairly quiet locality, respectively on 5th February 1961 (c/4), 18th February 1961 (c/4), 9th February 1963 (c/5) and 28th February 1964 (c/2, incomplete).

The c/4 he collected on 5th February 1961, in a marshy area on the outskirts of the town, were in an advanced state of incubation, the nest a shallow bowl placed a few inches above a temporary marsh in rank grassland. In this same locality eggs have been obtained of *Crex egregia*, *Porzana pusilla obscura*, *Sarothrura böhmi*, the Red-chested Crake (or Fluff-tail), *Sarothrura rufa* (Vieillot), and nearby the Black Crake, *Limnocorax flavirostra* (Swainson), which is more of a true marsh bird frequenting the edges of permanent water. These various crakes, he writes, appear in December, breed, and disappear in March.

Other species breeding in this area are the African Marsh Harrier, *Circus aeruginosus ranivorus* (Daud.), Blue Quail, *Excalfactoria adansoni* (Verreaux), and African Marsh-Owl, *Asio c. capensis* (Smith). Hopkinson has found remains of crakes in Marsh-Owl pellets. The four eggs which measure 31.1 x 21.0, 30.2 x 20.6 and 29.1 x 20.6 mm., and one which is damaged *c.*29.5 x 21.0 mm., are smooth with some gloss, and are now at the British Museum (Natural History). The ground colour varies from cream to warm buff or pale burnt umber, boldly mottled all over Indian red on underlying dark violet-grey; one egg has light burnt umber markings on underlying light grey. The rich markings somewhat resemble those on some eggs of the Red Grouse, *Lagopus scoticus* (Latham).

There are no data available for the c/4 taken on 18th February 1961; but the c/5 found on 9th February closely resembled the c/4 just described and measure 29 x 21, 29 x 22, 29 x 22, 29.5 x 20 and 28.5 x 21 mm.

On 28th February 1964, Hopkinson's pointer flushed a Striped Crake sitting on two perfectly fresh eggs, which were broken in the incident.

According to Hopkinson (*in litt.*) these crakes invariably place their nest in the centre of a tuft of the grass *Setaria* sp. either on the bank of a shallow drainage ditch—in two cases—or ten to twenty yards distant in the other two. When these tufts are burnt out each year, the re-growth forms a natural shallow depression in the middle of the tuft, thus providing an ideal nesting site for *P. marginalis.* These tufts grow all around and on the sides of the ditch, which usually contains a couple of inches of water during the rains (after any floods have abated). The *Setaria* tufts grow about three feet tall, with a diameter of nine to twelve inches, and the basal third of the tuft is very bushy. The cleverly concealed nest is immensely difficult to locate as the bird either sits very tight or runs through the grass for a few yards before flying—and only flies if put up by a dog. Neither Vernon, nor Hopkinson, have heard the Striped Crake utter any call, but Richard Brooke (writing from Salisbury) tells me that four of these crakes he saw together—believed to be a family party—on 30th May 1955 (an unusually late date) uttered a frequently repeated 'chup' or 'yup', sometimes taken up by all four birds together. They were on a pan by the Umniati river, about ten miles west of where the railway line crosses the river. They crept among the aquatic vegetation but were not so agile as Jaçanas and had to flutter over thin parts. In short flights the legs were trailed, but held horizontal if going far. In the same locality were Allen's Gallinule, *Porphyrula alleni* (Thomson), *Actophilornis africanus* and *Limnocorax flavirostra.* The dominant aquatic plants were water lilies, sedges (*Cyperus* spp.) and *Polygonum.*

C. W. Benson (*in litt.*) has very kindly provided me with a list of specimens of *P. marginalis* in museums in Southern Rhodesia and South Africa, from these two territories and from Northern Rhodesia. These records include two from Northern Rhodesia, respectively on 11th December (♂ near breeding) and 2nd January (♀); five from Southern Rhodesia (one a ♀ caught on 1st February when sitting on c/4, which I have already mentioned), four of which were collected respectively on 4th December (♀) 2nd February (breeding ♀), 10th February (♀) and 7th May (♂). A South African record is dated March and another ([19]: 66) is, presumably, May; examples in the Central African (formerly Congo) Museum, at Tervuren, from Elisabethville, were collected respectively on 20th December (*vide* Chapin) and 3rd January, and one in January from Upemba, in S. E. Congo (additional Congo records are mentioned later). Benson also refers to two other Northern Rhodesia specimens—one from Abercorn ([6]: 596–97) in extreme north, killed against a house on 31st March and the other collected at Lundazi on 2nd September—an exceptional record as the date is most unusual. Maclean's ([7]: 87) sight record from South-West Africa dated 13th September, 1958 is another unusual date. He observed the bird at a distance of fifteen feet and noted that it bobbed its tail vigorously. At Fort Rosebery (west of Lake Bangweulu), North-Eastern Rhodesia Lynes ([8]: 37) on 12th December collected a ♀ "very soon to lay eggs."

In the wet grasslands of the Balovale region of Northern Rhodesia, during December 1943 and January 1944, Africans trapped for C. M. N. White ([9]: 316–17) 4 ♂♂ and 3 ♀♀ *P. marginalis*, all in breeding condition. A ♀ trapped on 31st December laid an egg in captivity, measuring 29 x 21 mm., which was smooth, very thin shelled, rather blunt and not markedly pyriform. It was pinkish, the whole surface very thickly covered with dark rufous markings, and at the large end a dark rufous zone with still darker spots and some lilac marks. c/2 (fresh) taken on 19th January measured 28.0 x 20 and 28.5 x 20 mm. were as just described, but slightly glossier and with the yellow and red markings more intense. On 22nd January, half-incubated c/4 measured 29–31 x 17–20 mm. and resembled c/2, but are more sparsely spotted at narrow end and with much stronger marked zone at large end. The ♂ parent was trapped on each of these two clutches. White records that the description of Andersson's eggs from Ovamboland agrees with his eggs.

White noticed that *P. marginalis* when walking is much more at home on the ground than the Black Crake, which is seemingly better suited to climbing among reeds.

Although eggs have not been recorded from Nyasaland, Benson obtained on 4th January ([10]: 208) a ♀ with eggs yolking in the ovary from a water-logged, short grass dambo, on 8th February a ♀ with well enlarged ovary yolking and on 10th February a ♂ with enlarged testes; and R. C. Long collected a ♀ on 27th December, in a flooded dambo, ten miles North of Edingeni. The Fort Rosebery example and those just mentioned from Nyasaland—excepting the ♀ of 4th January—are all at the British Museum (Natural History). Benson ([11]: 450–51) further records from Nyasaland, 4 ♂♂ and 5 ♀♀ collected in the Fort Johnston region, all with gonads enlarged; three of these ♀♀ were collected respectively on 5th February, 7th February and 8th February.

In the Coryndon Museum at Nairobi there is an adult ♂ collected in the Tabora district of Tanganyika on 6th January which had greatly enlarged testes—evidently a breeding bird. Praed and Grant ([20]: 290) refer to a breeding bird (undated) from south-western Tanganyika. Other specimens, from Kenya, in the same museum are, an adult ♀ in breeding condition picked up near Nairobi on 17th May after striking a lighted window at night; an adult ♀, in full breeding condition with enlarged oviduct which was found in a hospital ward in Nairobi on 29th May, having apparently flown in through a lighted window during the night and this bird had certainly laid eggs prior to collection, and a juvenile ♀ in fresh plumage obtained at Ruiru on 10th September.

Jackson ([12]: 293) refers to two Kenya examples—one (not sexed) collected at Ribe, near Mombasa, in 1882 (no date) and the other (♂) shot in May in a marsh on the outskirts of Nairobi; this latter is in the Field Museum at Chicago. Jackson records "is either very rare or such a skulker " and "is not known to nest in Kenya". In 1947, I was shown an unmistakable egg of *P. marginalis*—it was bluntly ovate, measured 29.7 x 19.7 mm. and was cream colour, boldly and profusely marked reddish brown, mainly on the upper two-thirds, on underlying shades of grey and violet—which was taken (newly laid) from a nest in an inundated marshy hollow at Kabete, a few miles outside Nairobi. The nest was of rushes and grasses bent over and down to form a platform for the eggs, and a bower of grass was bent over the nest. In the same small swampy bottom were two Lesser Moorhen *Gallinula angulata* nests containing respectively four and five eggs.

I have no records of any Uganda specimens.

From the Sudan[13] there is no mention of the Striped Crake. Chapin ([14]: 9–10), referring to the Belgian Congo, records that on 29th May, at Rutshuru in the Kivu district, Eastern Congo, "a native brought me a male, freshly killed, from a grassy spot well away from water", but he does not mention the state of the sex organs. According to Benson (*in litt.*), from information furnished by Schouteden, three specimens in the Central African Museum at Tervuren were collected at Buta in the Lower Uelle district, north-east Congo, respectively on 20th May, 27th June and 12th December; another four were obtained at Butembo in the high lands west of Lake Edward, on 25th February, 14th and 25th May and 7th June; other examples are from Yalokele in the Ikela district, between 0° and 2° South and 22° and 24° East, on 9th December, and Lutunguru (Kivu), 0° 29′ South and 28° 47′ East, on 22nd June. As none of these Tervuren specimens is sexed it is difficult to suggest a breeding season, but one would expect it to be after the rainy season. In West Africa, the Striped Crake is equally rare, or elusive, as elsewhere. Bates ([15]: 68) on 30th June 1925, near Maidugari in Bornu, north-eastern Nigeria, obtained a ♀—caught by villagers—which from the state of the ovaries was near its breeding time. According to Bannerman ([16]: 17–19) in West Africa one example has been obtained at Bipinde (Cameroon) and two in Gabon. Further, according to Bannerman ([17]: 152–53) "it is evidently a resident species with, quite possibly, strong migratory tendencies". In view of my own East African experience over a period of more than thirty years I am inclined to challenge the assumption of possible "strong migratory tendencies." For, until we know a great deal more about the habits and habitat of this elusive species, I am of the opinion that the operative word in Bannerman's comment is "resident", and that during the rains and flood season there is a dispersal of the Striped Crake from its normal (swampy?) haunts in order to breed and that long distance migratory movements are unlikely.

Bannerman ([17]: 152) quotes Serle's description of c/5 *P. marginalis* taken at Kwarre, Northern Nigeria, on 5th August.

"The eggs are singularly handsome and quite unlike those of the other

Rails. The markings bear a resemblance to a heavily marked Kestrels' egg. They are ovate, smooth-shelled, and show a fair degree of gloss. They are richly and thickly marked so that the light buff ground is scarcely visible. The shell is blotched, spotted, and speckled with rich red-brown. At the broad end the red-brown markings are confluent and together with the subjacent markings form a solid cap or wreath which may cover a third of the shell area. The pale ashy undermarkings take the form chiefly of blotches and suffusions. They are well distributed. The eggs measure 28.7 x 21.3, 29.7 x 21.9, 29.9 x 21.7, 29.2 x 21.6, and 28.8 x 21.8 mm.

The brooding bird, the ♂, was trapped on the nest, which was on a dry bank (about two feet wide) separating two flooded fields of rice. The bank was about one foot above the water level and the nest, concealed in coarse herbage, was a dry grass-lined, shallow, circular depression, about 82 cm. diameter.'' In view of some previous remarks it is of interest to note that ''*Porphyrula alleni*, *Gallinula angulata* and *Actophilornis africanus* were breeding within a radius of one or two hundred yards and probably shared its terrain.'' In Ghana ([18]: 175), on 23rd June 1956, a ♂ Striped Crake and a ♀ with an egg in the oviduct were collected near Bigada, at the mouth of the Volta River; the stomachs contained insects. The country is marshy savannah, with small scattered thickets into which the crakes retreated when flushed. These two specimens are at the Smithsonian Institution, Washington.

The known breeding seasons of *P. marginalis* are:—

REPUBLIC OF SOUTH AFRICA, no evidence of breeding.
SOUTH-WEST AFRICA (DAMARALAND), February and March (to May?)

SOUTHERN RHODESIA, NORTHERN RHODESIA and NYASALAND, January and February; also, probably south-east CONGO.

TANGANYIKA (TABORA), January.
KENYA (NAIROBI), May and June.
NORTHERN NIGERIA, July and August.
GHANA, June and July.

Twenty-four eggs average 29.6 x 21.2 mm., with a measurement range 28.7–33.0 x 19.7–23.0 mm. The smallest egg is from Kenya, 29.7 x 19.7 mm. Five Nigerian eggs average approximately 29.3 x 21.7 mm. and are not so long as fifteen eggs from Southern Rhodesia which average 29.9 x 21.36 mm. Additionally, White ([9]: 316) records c/4 from Northern Rhodesia with a range 29–31 x 17–20 mm.; 17 mm. represents an abnormally narrow egg.

CONCLUSIONS

According to Roberts Revised (1957) ''Inhabits short, damp grasslands'', but this seems to refer to what is known of this crake during the breeding season, for little has been recorded as to where it is likely to be found at other times of the year. That it is a skulker and elusive is indicated in the observations of Jackson, Neuby Varty and Hopkinson and ordinarily it would be exceptional even to glimpse it at breeding time.

In the knee-high grasslands of the Equatorial region of Kenya and Uganda I frequently flushed rails (spp. indet.) when walking through the wet grass—they were never flushed a second time no matter how thorough the search. I did not regard these birds as migrants, but suspected that they had dispersed temporarily from a swamp habitat—in the localities to which I refer areas of marsh, large and small, were never far distant—because adverse conditions had forced them out or possibly because of the attraction of good feeding in the grasslands during the rains. But this is surmise. Benson believes that an example collected at Lundazi, Northern Rhodesia on 2nd September and a sight record from South-West Africa dated 13th September, constitute abnormal occurrences of a species which should be absent from these territories, but I incline to the theory that in each case it is a stray from a not so remote swamp region. The bird's long legs seem to suggest a swamp habitat. What is indisputable is the fact that the Striped Crake does indulge in movements—either local or otherwise—during the hours of darkness when it flies at no great height and is evidently attracted by lights which brings it into towns and houses—other species of African rails are known to do likewise. Investigation of crop and stomach contents could indicate from where it obtains its food; it may be that it is nocturnal and feeds by night. It is possible that the widely distributed *Porzana marginalis* is not a rarity, but is seldom observed on account of its skulking habits and habitat; where it is to be found outside the breeding season has yet to be discovered.

I am greatly indebted to C. W. Benson, Richard Brooke, G. W. Hopkinson, B. V. Neuby Varty, the late Austin Roberts, Carl Vernon and John G. Williams for the much appreciated information they have variously sent me about the nests, eggs, distribution and museum specimens of the Striped Crake; and to Neuby Varty especially for the photograph of four eggs.

Benson, Brooke, Hopkinson and Vernon have all seen this paper; their useful comments and advice are much apppreciated.

Benson ([19]: 56), in "support for the suggestion that *P. marginalis* is a long distance migrant" from the north to breed in southern Africa, refers to a ♂ specimen in the American Museum of Natural History which was collected on one of the Aldabra Islands, in the Indian Ocean, on 10th December 1904, "presumably blown completely off course on southward migration." This may be so, but is inconclusive in the absence of further evidence, and it is possible that under the peculiarly adverse weather conditions which are liable to occur in eastern Africa a bird of weak flight, such as a rail, can be driven hundreds of miles off its course when on a local movement. In East Africa I have known cases of species with relatively strong powers of flight driven some 300 miles off course in an exceptionally violent storm.

The American Purple Gallinule, *Porphyrula martinica* Linn. is of regular occurrence on Tristan Da Cunha, in the South Atlantic Ocean and Elliott ([21]: 579–80) records "When the migration route of a weak-flying species (which is particularly dependent on drifting down-wind) lies in an area subject to cyclonic disturbance, it is frequently thrown right off its course."

Some other instances of how far "off course", to the east, this gallinule may be thrown include three recent occurrences (29th April 1962, 30th

April 1963 and 19th May 1963) from the vicinity of or at sea (60 miles out) off Capetown ([22]: 249–51); three examples presumed to be this species caught on St. Helena in 1961 (1) and 1962 (2), communicated by A. Loveridge (should these gallinules have originated from the African mainland, the sea passage would still be exceptional); and one recorded from the Scilly Isles by Nisbet ([23]: 145–57).

SUMMARY

The available breeding records, published and others, of *Porzana marginalis* are enumerated and discussed.

Breeding seasons are recorded for various territories in Southern and Eastern Africa, Ghana and Northern Nigeria.

The Striped Crake nests variously outside the main swamps and marshes and in grasslands subject to flooding.

It will nest in fairly close association with other rails and the smaller aquatic species.

Both sexes take part in incubation.

The nest, which has a bower, and the handsome eggs, are described.

There is a reference to black downy chicks.

Conclusive evidence is offered of its skulking, elusive habits.

Conclusions and conjecture concerning this crake's habitat and movements are recorded.

BRITIS NAT. HIST. 3 - FEB 1965

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CONTRIBUTORS

Contributions are not restricted to members of the B.O.C. and should be addressed to the Editor, Mr. John Yealland, The Zoological Society of London, Regent's Park, London, N.W.1. These should be concise and typed on one side of the paper, double-spaced, with a good margin. The first time a species is mentioned, the scientific generic and specific names should be included. Subsequently the same name need only have the initial letter of the genus. Scientific names are printed in italics and should be underlined in the typescript. References should be given at the end of the paper.

Authors introducing a new name or describing a new species or race should indicate this in their title and display the name prominently in the text followed by *nom. nov.*, *sp. nov.*, *subsp. nov.* as appropriate. In these descriptions, the first introduction of the name should be followed by paragraphs for "Description", "Distribution", "Type", "Measurements of Type", "Material examined" and further sub-headings as required.

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DINNERS AND MEETINGS FOR 1965

16th February, 16th March, 20th April (A.G.M.), 18th May, 21st September, 19th October, 16th November and 21st December.

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The six hundred and twenty-third meeting of the Club was held at the Rembrandt Hotel, London, on 16th February, 1965

Chairman: Major-General C. B. Wainwright

Members present 20; Guests 5.

Mr. Henry Thoresby spoke on birds seen by him in the central highlands of eastern New Guinea, illustrating his talk with coloured film and slides and playing recordings of the birds' calls.

Further on *Passer motitensis* (Smith)

by P. A. Clancey

Received 8th November, 1964

In my note on the original description of *Passer motitensis* (Smith) in *Bull. B.O.C.*, vol 84, 6, 1964, p. 110, I omitted to make mention of the fact that by adopting the 1836 description in the *Report Exped. Explor. Cent. Africa*, p. 50, in preference to the later one in the *Illustr. Zool. South Africa*, Aves, 1848, pl. cxiv, the name *motitensis* Smith 1836, takes precedence over Gould's *Pyrgita iagoensis*, 1838, described from São Tiago, in the Cape Verde Islands, as the specific name of this polytypic species of sparrow.

Moreau, in the continuation of Peters' *Check-List of Birds of the World*, vol. xv, 1962, pp. 15, 16, admits eight races of what must now be known as *Passer motitensis* (Smith), namely the subspecific taxa *cordofanicus* Heuglin 1871, *shelleyi* Sharpe 1891, *hemileucus* Ogilvie-Grant and Forbes 1900, *insularis* Sclater and Hartlaub 1881, *rufocinctus* Finsch and Reichenow 1884, *motitensis* (Smith) 1836, *iagoensis* (Gould) 1838, and *benguellensis* Lynes 1926, to which has since been added *subsolanus* Clancey 1964.

Correction: On p. 38 of the *Bulletin* (February, 1965) the diameter of the nest of the Striped Crake was given as 85 cm. This should, of course, have read 85 mm.

Comments on plumage variations in the genus *Euplectes* Swainson

by BRYAN L. SAGE

Received 16th August, 1964

As plumage variations in wild populations of the various species of Bishops, *Euplectes* spp., are apparently uncommon, it seems worth placing on record details of aberrations noted in three of this genus. A number of the Bishops are kept in captivity and no doubt plumage variations have been noted under these conditions, but I have not searched the avicultural literature. However, Rollin (1962) has described a case of non-hereditary melanism in a captive Orange Bishop, *Euplectes orix franciscana* (Isert).

(i) RED BISHOP, *Euplectes o. orix* (L.).

Transvaal Museum No. 6673. Collected at Matabiele, East Griqualand, Cape Province, South Africa, on 26th January 1911, by L. J. Davies.

I am indebted to Mr. Richard Brooke for details of this specimen which I have not been able to study. The bird is a female with the breast and abdomen off-white, the central dark streaks on the breast feathers have nearly disappeared; the normal brown of the head, back, wings and tail is almost entirely replaced by dull white, and what brown remains is paler than usual.

It would seem that the abnormal plumage coloration of this specimen is a result of the almost complete absence of the brown phaeomelanin pigment.

(ii) RED-CROWNED BISHOP, *Euplectes hordeacea* (L.)

Collected about 25 miles north of Fort Jameson, Northern Rhodesia, on 3rd March, 1937.

Details of this specimen have been supplied by Dr. J. M. Winterbottom; it was at one time in the collection of the British Museum (Natural History) but cannot now be traced. The specimen was a male in which the normal black of the forehead, wings and tail was replaced by white, whilst the red areas of the plumage were unaffected.

Here we have an apparently straightforward case of complete absence of the black eumelanin and retention of the red carotenoid pigment. It is of interest to note that Mackworth-Praed and Grant (1955) state in respect of the male—"Occasionally albinistic or with general colour very pale and wings and tail white; bill and eye remain black".

(iii) YELLOW BISHOP, *Euplectes capensis* (L.)

Rhodes-Livingstone Museum No. 13258. Collected at Katombara, Northern Rhodesia, on 17th January 1964, by Anthony Balcomb.

This most interesting specimen is a male in which the carpal area, lower back and rump, are bright lemon yellow as in normal individuals. In normal males the remainder of the plumage is clear jet black, but the flight feathers are browner with lighter edgings. In the aberrant specimen the primaries and secondaries are pale brownish-grey; the lower breast, belly, mantle, nape and crown, are silvery-grey, each feather being tipped with black; upper breast, forehead and ear-coverts blackish; tail dark greyish-black. The forehead, ear-coverts, mantle and upper breast are tinged with olive green. The soft parts are as in normal specimens.

In this specimen we have another instance of a carotenoid pigment, in this case yellow, remaining unaffected whilst the melanin has been modified. The interesting point is the existence of the olive green wash which is not evident in the normal male plumage. A single feather from the upper breast appeared silvery-grey with a black tip, and a yellowish subterminal area. A microscopical examination of this feather was made for me by Dr. L. Auber upon whose report the following details are based.

The barb contains what appears to be a yellow carotenoid pigment of a diffused appearance, with a small amount of scattered melanized granules. The basal portion of the individual barbule contains this yellow pigment again associated with scattered black granules. The distribution of the black granules increases in density in the terminal portion of the barbule to such an extent that the terminal two-thirds appear deep black. The silvery-grey colour of the basal portion is due to practically the same distribution of black granules, but the yellow pigment is absent. In the anterior portion of the feather the melanized granules increase in density in both barbs and barbules, thus giving rise to the black appearance. The optical impression of olive green is, therefore, due to an "apposition" effect of minute areas of yellowish (barbs and rows of barbule bases) and the black of the remaining parts of the barbules.

The above details indicate that the aberrant feather differs from the normal black feather in the restriction of the quantity of melanized granules. It seems probable that the normal black feathers contain the yellow pigment, but that it is usually masked by the close packing of the melanized granules. Harrison (1963) has described a somewhat similar case in a male Golden-backed Weaver, *Ploceus jacksoni* Shelley, which is almost entirely yellowish, deepest on the head, wings and tail. The normal male of this species has the head black, wings and tail mainly black and greenish, and the mantle chestnut.

The production of olive shades by the apposition of, roughly, yellow pigmented barbs and black pigmented rows of barbules occurs in various groups of birds. A typical example is the Zosteropidae (see Moreau, 1957) in which yellow carotenoid and three types of melanin pigment are present. In the terminally exposed portion of each contour feather the barb and/or individual barbules have part of the length yellow and the remainder melanic. Superimposed on each other in the plumage they give, by a "lattice" effect, a visual appearance of greenish.

ACKNOWLEDGEMENTS

The preparation of this paper was largely inspired by Mr. C. W. Benson of the Rhodes-Livingstone Museum, Northern Rhodesia, who kindly invited me to study the aberrant specimen of the Yellow Bishop. Dr. J. M. Winterbottom and Mr. Richard Brooke kindly supplied details of the other two abnormal *Euplectes* species. I am most grateful to Dr. L. Auber for the time and trouble spent in making a detailed examination of the feather from the Yellow Bishop. At the British Museum (Natural History) I have to thank Mr. J. D. Macdonald for giving me access to the *Euplectes* material in the collection, and Mr. C. J. O. Harrison for useful discussion.

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Concealed yellow pigment in the breeding plumage of some weavers

by C. J. O. Harrison

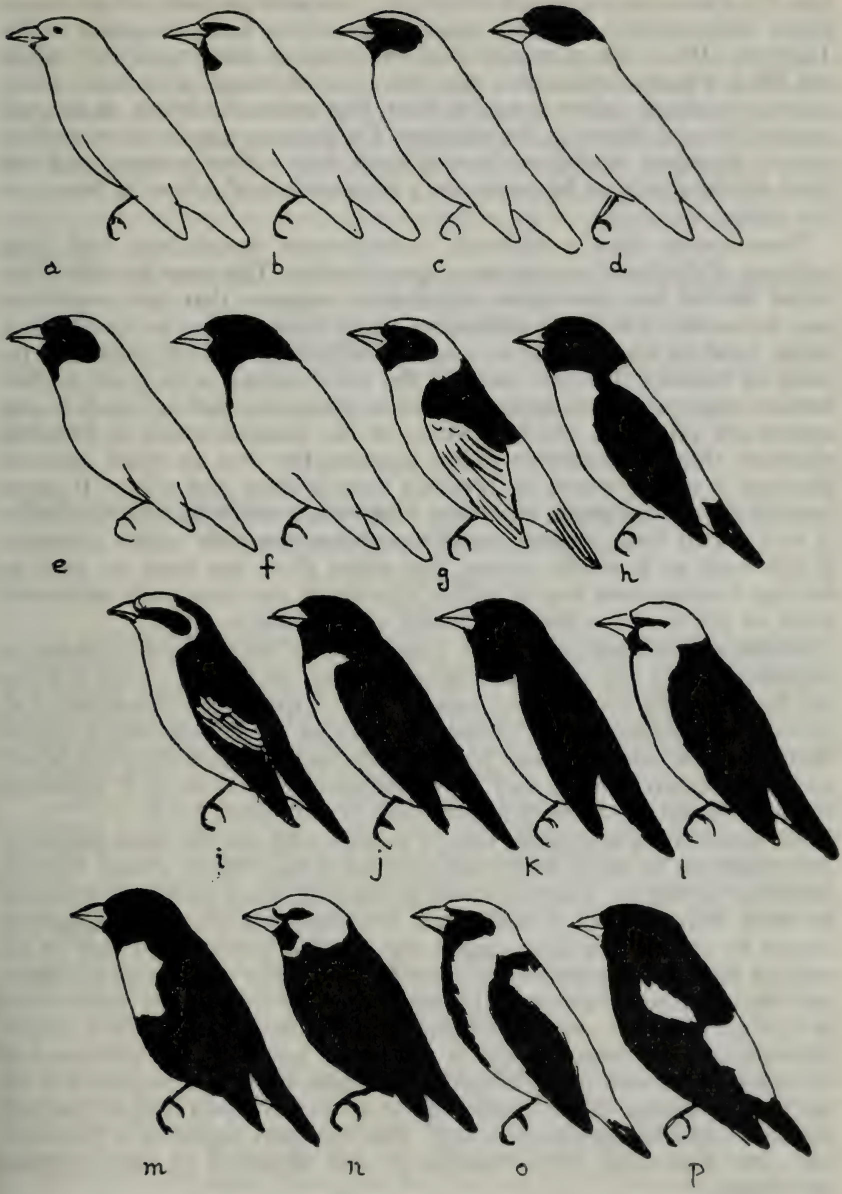
Received 27th October, 1964

The males of a large number of weaver species (Ploceidae) in Africa have a breeding plumage patterned in yellow and black. In *Ploceus melanogaster* (Fig. n) the male is almost entirely black, the head only being deep yellow with a black streak through the eye, and a black throat separated from the similarly coloured under side by a narrow golden band. A male of this species showing an interesting example of partial non-melanism was collected by the Rev. W. Serle in British Cameroons on 29th March, 1948. This bird has lost the black throat patch and has a clear yellow throat with a narrow black border in places. The belly, under tail-coverts and posterior flanks are entirely light yellow: there are a few yellow feathers on the rump. Most of the primaries on the right wing and some on the left wing are yellow and pale buff, as are some of the tail feathers, the presence of buff suggesting that some of the phaeomelanin has been retained in places. Some of the right wing-coverts are white with a yellow border, and a few have a black border, a narrow yellow zone inside that, and a white centre. Most of the feathers of wings, mantle and breast show a reduction of melanin towards the base, and where melanin is reduced on mantle and breast there is evidence of yellow pigment.

A specimen of *Euplectes capensis* described above by Sage appears to be a similar example of reduction of melanin in parts which are normally black, revealing the presence of yellow pigment.

Examples of total loss of melanin in the Ploceidae appear to be rare. A non-melanic specimen of *Ploceus jacksoni* was collected by C. W. Chorley in Uganda on 12th May, 1928 and is in the collection of the British Museum (Natural History) (Reg. No. 1929. 1. 7. 43). This is a male and is entirely yellow. The colour is very intense on wings and tail, less so on the breast and sides of the head, while the remainder of the plumage, including the mantle, is very pale. Since males in breeding plumage have an intensely golden mantle it is suspected that this specimen is in the non-breeding plumage in which the mantle pigment would be mainly melanin, giving a dark-streaked olive green colour in the normal bird. This is presumably the specimen which gave rise to the reference to xanthochroic examples by Mackworth-Praed and Grant (1955). It has been suggested that the terms Xanthic and Xanthochroic are not valid for plumages of this type, which should more correctly be called non-melanic (Harrison 1963).

The evidence of these specimens suggests that in this family there is a tendency for yellow pigment to be present not only in those parts of the plumage where it may have some signal value in epigamic displays, but also where it is masked by heavily melanized plumage. It is not the case in all black and yellow pigmented species, for in non-melanic forms of the



Diagrammatic representation of the breeding plumages of some yellow and black weavers.

(a) *Ploceus xanthops*. (b) *P. ocularis*. (c) *P. spekeoides*. (d) *P. stuhlmanni*. (e) *P. pelzelni*. (f) *P. alienus*. (g) *P. nigrimentum*. (h) *P. insignis* ♀. (i) *P. reichenowi*. (j) *P. bicolor*. (k) *P. golandi*. (l) *P. nigricollis*. (m) *Malimbus racheliae*. (n) *P. melanogaster*. (o) *Euplectes afra*. (p) *E. capensis*.

Blue Tit, *Parus caeruleus*, and Goldfinch, *Carduelis carduelis*, which retain yellow pigment, the normally black areas of the feathers appear white (Harrison, 1963). An examination of the plumage patterns of the yellow and black weavers reveals that they show a wide range of variation from almost completely yellow species to birds that are mainly black. A selected range of these is shown in the diagram. The patterns appear too varied to suggest divergent evolution from a black and yellow pattern, and the trend would appear to be rather for a replacement of yellow by black, or *vice versa.*

These species have a relatively homogeneous morphology with little evidence of divergent evolutionary specialisation. This together with their rather limited but continuous distribution suggests that their evolution may be recent. The black patterning varies from species to species in a rather random manner and in some the difference between male and female, or between different races of the same species, is as great as that between one species and another. Areas of plumage which are black in one species are yellow in another. Many of the females, when in breeding plumage, show considerable yellow pigmentation but no black areas of plumage in species where the breeding male is black and yellow. It seems possible that in this group there may have been a relatively rapid evolution of very varied black patterns superimposed on a mainly yellow plumage. If this were so it would appear that either there has been no need to develop a subsequent loss of yellow pigment in the completely melanized areas, or else there has been insufficient time for this to occur.

Additional information on the distribution of such hidden pigments is necessary before any more definite conclusions can be put forward. Some can be gained by a superficial examination of specimens. Examples of *P. reichenowi*, *P. bicolor*, and *P. melanogaster* (Figs. i, j, n) examined in a good light show the black plumage to have a distinct but faint olive tint, which was more apparent when they were compared with skins of *P. albinucha maxwelli* which lacks yellow pigment and is completely black.

No mention has been made here of weavers with red and black plumage. Winterbottom (in Sage, 1962) has recorded a male Black-winged Bishop, *Euplectes hordeacea*, which is stated to have the black markings replaced by white while the red is unaffected. Unfortunately the actual specimen cannot be traced. This does suggest that in some species there may be no masked carotenoid pigment in areas of completely melanized plumage, and this might relate either to the extent to which the pattern had evolved in this species or to some difference in the reaction of red and yellow pigments in such circumstances. It was found, however, that specimens of species with red and black breeding plumages showed a purplish tint on the black plumage of the under side to an extent which suggest that red pigment might be present there also. This was more apparent in *Euplectes orix*, less noticeable in *E. hordeacea* and appeared to vary between individuals.

Concealed pigments of this type do not appear to be mentioned in most pigment studies. Dr. L. Auber refers to a caroteinoid masked by melanin in the dark head-markings of *Merops apiaster* (Auber, 1958), and also states (pers. comm.) that a similar concealed pigmentation seems to occur in parts of the plumage in some parrots *Platycercus* spp. and Turacos *Musophaga* spp. The pigmentation in the Budgerigar *Melopsittacus* *undulatus*, seems a little more complex. In the non-melanic specimen on which the statements in an earlier paper (Harrison, 1963) were based, many feathers, particularly the wing-coverts, appear white on those portions where melanin is absent, although a closer inspection has revealed very slight traces of yellow. An examination of other specimens shows that there is a range of variation from this to individuals in which such feathers appear almost uniformly yellow. It is not clear which type would represent a simple loss of melanin since the specialised breeding of this species in captivity has produced variations in pigmentation intensity.

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Pycnonotus plumosus subspp. with the description of a new subspecies from Bawean Island

by A. Hoogerwerf

Received 29th February, 1964

It is known that in museum material of this species, as with *Pycnonotus simplex* and *P. brunneus*, the plumage is subject to fading and discolouring to such an important degree that we must be very cautious and critical when comparing old skins with freshly obtained material. Also it is of outstanding importance to take into account the age of the skins to be compared when looking for racial characters.

Together with a collection of about 50 fresh skins, for the greater part obtained from the Sunda Strait area and Bawean Island, I critically studied all old material present in the Bogor Museum. Because when describing new races or discussing existing ones of this particular species, much stress has often been laid on differences in wing size, full attention was also paid to such details.

Stressmann[9] states that *hutzi* is smaller (wing: 78–84 mm. in two adult males and three females) than *insularis* (= *hachisukae*) but we found a wing length of 80–86 mm. in eight *hutzi* against 77–90 in 29 *plumosus* and Chasen and Boden Kloss[5] give 79–90 mm. as a wing length for *hachisukae*, so that the difference in wing size between *plumosus*, *hutzi* and *hachisukae* seems not very convincing. The subspecies *porphyreus* (wing: 77–91.5 mm.) and *billitonis* (wing: 79–86 mm.) fit well within the wing measurements as found by me for 29 specimens of the nominate race (77–90 mm.). The same holds good for the material of this species collected within the areas in and around the Sunda Strait and on the island of Bawean with wings of 77–90 and 82–90 mm. respectively. But Bawean birds average smaller in the bill and have a longer tail.

Rather large in all their measurements are the few specimens from the Riouw Islands which I examined and they are rather light in plumage making them worth a further study when more material becomes available.

Beyond the differences in size, *hutzi*, *hachisukae* and *billitonis* should be lighter in the colour of the under parts compared with *plumosus*, which means that birds belonging to the nominate race must be very dark, because the skins of *hutzi*, even now—25 and 30 years after they were secured—are dark on the under parts, though doubtless they are much lighter now than when they were collected. This is evident when comparing skins from Bawean secured 25 years ago with a good series of fresh material. Also three skins from Sumatra's east coast (Deli and Palembang) which areas according to Boden Kloss[2] must be considered as part of the range of the nominate race (see also Peters[7]) still show that dark colour on the under surface very clearly though they were taken 16 and 36 years ago. Owing to this characteristic such birds differ at a glance from much lighter Javan skins, stored during about the same period and under similar conditions. This old Javan material does not differ in this respect from birds from Bawean collected 25 years ago, so that it does not seem justified to include representatives living on Java and Bawean into the nominate race. The under parts are too light, not only when compared with true *plumosus* and still darker *porphyreus* but also with *hutzi* and *hachisukae*.

Mayr[6] calls *hachisukae* not a very distinct race. As wing length of a male from south Borneo he gives 87 mm. and for two females 81 and 82 mm. and for the length of the tail in 1 ♂ and 4 ♀ 75, 70, 72, 72 and 72 mm., which does not justify Mayr's view that these birds agree with *hachisukae* because of their size: they have a shorter tail, averaging much smaller than 9 ♂ and 8 ♀ from north Borneo, measured by Chasen and Boden Kloss[5], especially when separating birds from the islands off north Borneo, the real habitat of *hachisukae:* These south Bornean skins perhaps belong to *hutzi* though Peters[7] only mentions north and east Borneo as the range of this form, restricting the range of *hachisukae* to the islands off Borneo.

The measurements given by Chasen and Boden Kloss for a series of birds from north Borneo give rise to the supposition that north Bornean representatives average somewhat larger in the wing than birds of the nominate subspecies and *hutzi*, and have a longer tail in both sexes. But when separating in this series birds from the islands off north Borneo (5 ♂ 4 ♀) and those from north Bornean mainland (4 ♂ 4 ♀) there is a distinct difference in wing and tail measurements, making it well justified to unite the larger island birds with *hachisukae* and to consider the material secured on the mainland as *hutzi*. In the first category the average wing and tail measurements are: ♂ Wing, 88.40, Tail, 81.40; ♀ W. 87.33, T. 79.25 and for the second group: ♂ Wing, 84.75, Tail, 77.50; ♀ W. 82, T. 71.25 mm. which shows important differences for such a small series.

Chasen and Boden Kloss[5] pointed to the dissimilarity of both populations, considering the mainland birds *plumosus* ≷ *insularis* and Stresemann[9]) too called them somewhat intermediate between real *insularis* (= *hachisukae*) and *hutzi* so far as it concerns the wing measurements.

Lack of fresh material from Java's mainland makes it impossible to separate birds from this island on the strength of a satisfying diagnosis, though the particulars given above clearly show that there is reason to do that because of the very light coloured under parts. The few birds obtained from the most western part of Java seem somewhat intermediate between dark *plumosus* and the lighter populations of more eastern localities on this island. A single bird collected on the small island of Sangijang in the Sunda Strait and some skins from Udjung Kulon, Java's most western peninsula, seem to be the representatives of such a light coloured population. But until there is more fresh material from Java I think it better to indicate the population on Java as *Pycnonotus plumosus* subsp. in order to make it clear that these birds cannot be united with the nominate race from the Malay Peninsula and Sumatra's east coast. After having examined a large series of fresh skins collected on Prince's Island, Sebesi, Sebuku and Legundi (Sunda Strait area), I think it justified to include those islands into the range of the nominate subspecies.

After comparing this material with the good series we obtained on Bawean Island it cannot be doubted that birds living here need to be separated, not only on account of their lighter under parts but also because of the different colour of the upper surface. The different tone of the under surface is striking when comparing fresh material but it is still noticeable—though to a smaller degree—when comparing Bawean skins from 1928 with those from Sumatra obtained in 1939.

On account of the light under parts, the Bawean birds may show some resemblance to *hachisukae* from certain islands off Borneo, also separated on account of its light under parts, but Mayr[6] does not mention this character for the five birds from south Borneo, which were classified as *hachisukae* because of their similarity in size only, making it probable that colour differences with *plumosus* are not very strikingly present.

Five skins borrowed from Singapore's National Museum, belonging to *hachisukae*, indeed do not differ in the tint of the under parts from representatives of the nominate race: the belly and the under tail-coverts are even darker than in the average *plumosus* and this difference is very distinct after comparison with birds from Java. These *hachisukae* specimens have decidedly darker under parts than has *billitonis*.

On the upper surface they do not differ from birds of the nominate race secured at about the same time. These old *hachisukae* skins are strikingly darker on the upper as well as on the under parts than birds from Bawean Island obtained at about the same period (1927/28) which makes it at once impossible to unite them. Also when comparing our old Bawean material with large series from west Java, present in the Leiden Museum, the same differences were established as was the case after comparison with the Bogor material.

A small series (5 ♂ 1 ♀) recently collected in east Borneo, differs from the Bawean birds on account of the somewhat darker under surface and darker upper parts, especially because of their darker tail. Moreover the wings (5 ♂: $\underset{83}{\underline{82\text{–}84}}$ 1 ♀: 79 mm.) and tail (5 ♂: $\underset{72.60}{\underline{71\text{–}74}}$ 1 ♀: 68 mm.) are considerably shorter but the bill averages heavier (5 ♂: $\underset{14.75}{\underline{14.5\text{–}15.5}}$ 1 ♀: 14 mm.) when compared with Bawean's population of the species.

Because of the small size of wing and tail in these Bornean birds it seems right to consider them *hutzi* and not *hachisukae*.

I propose to separate Bawean birds of this species under the name:

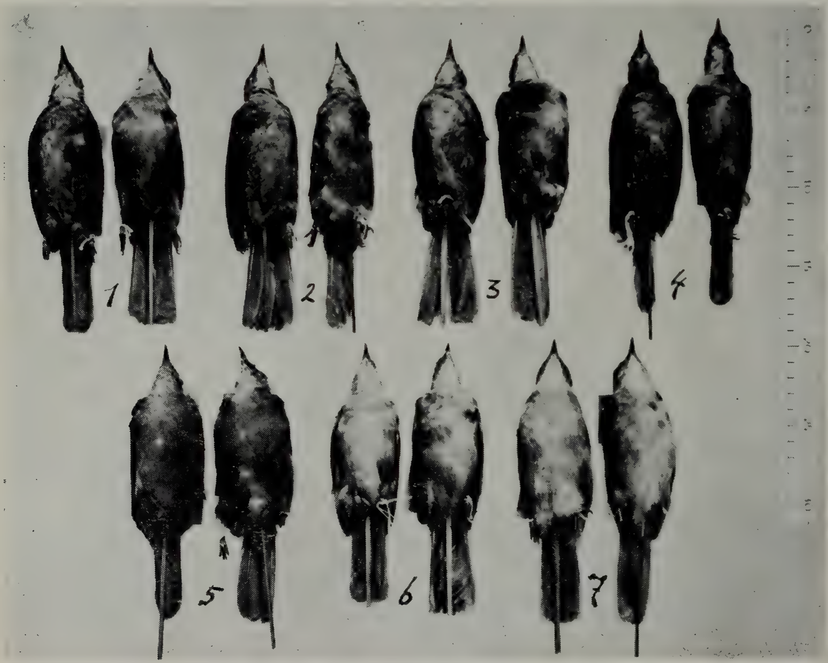
Pycnonotus plumosus sibergi subsp. nov.
Types: ♂ Mus. Bog. No. 22.868, 5th June, 1954, Central Bawean.
♀ Mus. Bog. No. 22.879, 25th June, 1954, South Bawean.
leg. A. Hoogerwerf

Description: ♂ ♀ Bill averages a trifle smaller in both sexes than in any other subspecies known from Indonesia, especially in the females. Tail averages longer than in nearly all birds of the other Indonesian races, except perhaps *hachisukae.*

Averaging much lighter on the under parts than *plumosus* and *porphyreus* and still lighter than *hutzi* and *hachisukae*, but perhaps rather similar to *billitonis* which—however—has a longer bill and averages in being smaller in wing and tail measurements.

Compared with all these subspecies the colour of the under parts is paler and less washed with olive in the dark parts. The brown on the lower belly and under tail-coverts is duller, less clear olive brown when compared with skins from other localities, obtained at about the same time, most resembling Javan birds.

On the upper surface *sibergi* is a trifle duller than fresh *plumosus*, less washed with green, especially on lower back and tail-coverts. When compared with fresh *hutzi* from east Borneo, it is evident that *sibergi* is



♂♀ *Pycnonotus p. plumosus* (freshly collected).
1. Udjung Kulon; 2. Prince's Island (Sunda Strait); 3. Sebesi Island (Sunda Strait); 4. South Sumatra; 6. Bawean Island, *Pycnonotus plumosus sibergi* subsp. nov.
♂♂ *Pycnonotus plumosus* (old material)
5. *Pycnonotus plumosus porphyreus:* West Sumatra; 7. *Pycnonotus plumosus sibergi* subsp. nov.

still lighter on the under parts and also on the upper surface, especially on the tail which makes it possible to separate at a glance birds belonging to both these races, also without considering size differences.

The racial colour differences become less striking in old material which show much fading and discolouring.

Irides red or brownish-red; light brown in juveniles.

Distribution: Bawean Island (Java Sea, between Java and Borneo).

The subspecific name is devoted to one of the first Heads of the Civil Administration of Bawean Island, Mr. J. Alting Siberg[1] who was the first author to publish particulars concerning the fauna of this island.

Measurements (*in mm.*)

♂♂ Wing: plumosus (Java): 82, 83, 85, 87, 89; *plumosus* (Leiden material, Java): 80, 85, 87, 88; *plumosus* (Prince's Island): 78, 85, 85, 86, 86, 86, 87, 87, 89, 90; *plumosus* (other islands Sunda Strait): 85, 87, 87, 88, 88, 89; *plumosus* (Udjung Kulon, west Java): 89; *plumosus* (Riouw Islands): 89, 89; *plumosus* (Sumatra): 82, 83; *sibergi* (Bawean Island): 85, 85, 86, 87, 87, 87, 88, 88, 88, 88, 90, 90; *billitonis* (Billiton Island): 82, 86; *porphyreus* (Sumatra): 82, 88; *hutzi* (Borneo): 81, 82, 86; *hachisukae* (Borneo): 86, 87, 87, 88, 90: *hachisukae* (Leiden-material, Borneo): 85, 89;

Tail: plumosus (Java): 70, 70, 76, 77, 78; *plumosus* (Leiden material, Java): 70, 73, 77, 79; *plumosus* (Prince's Island): 67, 67.5, 71, 71.5, 71.5, 72, 73.5, 78, 80, 81; *plumosus* (other islands Sunda Strait): 71, 72.5, 73, 75, 78, 78; *plumosus* (Udjung Kulon): 72.5; *plumosus* (Riouw Islands): 77.5, 79; *plumosus* (Sumatra): 71, 75.5; *sibergi* (Bawean Island): 73, 74, 77, 77, 77, 78, 78, 79, 79, 80, 80, 83; *billitonis* (Billiton Island): 74, 77; *porphyreus* (Sumatra): 66.5, 70.5; *hutzi* (Borneo): 67, 68, 70.5; *hachisukae* (Borneo): 75, 77, 78, 80, 82;

Culmen: plumosus (Java): 12, 13.5, 14, 15, 16; *plumosus* (Leiden material, Java): 14, 14, 15, 17; *plumosus* (Prince's Island): 13, 13, 13, 14, 14, 14.5, 15, 15, 15.5, 17; *plumosus* (other islands Sunda Strait): 13.5, 15, 15, 15, 16, 16; *plumosus* (Udjung Kulon): 14.5; *plumosus* (Riouw Islands): 14.5, 16.5; *plumosus* (Sumatra): 13, 14.5; *sibergi* (Bawean Island): 12.1, 12.1, 12.2, 12.4, 12.9, 13.4, 13.5, 14, 14.9, 15, 15; *billitonis* (Billiton Island): 15, 15; *porphyreus* (Sumatra): 13, 16; *hutzi* (Borneo): 14.5, 14.5, 15.5; *hachisukae* (Borneo): 13.9, 14, 14.2, 15, 15.

Max., min. and average measurements:

	plumosus						
	Java	Java Leiden material	Prince's Island	Strait Sunda	Udjung Kulon	Riouw	Sumatra
Wing:	82–89	80–88	78–90	85–89	89	89, 89	82, 83
	85.20	85	85.90	87.33		89	82.50
Tail:	70–78	70–79	67–81	71–78	72.5	77.5, 79	71, 75.5
	74.20	74.75	73.30	74.58		78.25	73.25
Culmen:	12–16	14–17	13–17	13.5–16	14.5	14.5, 16.5	13, 14.5
	14.10	15	14.40	15.09		15.50	13.75

	sibergi Bawean	*billitonis* Billiton	*porphyreus* Sumatra	*hutzi* Borneo	*hachisukae* Borneo
Wing:	85–90	82, 86	82, 88	81–86	85–90
	87.42	84	85	83	87.43
Tail:	73–83	74, 77	66.5, 70.5	67–70.5	75–82
	77.92	75.50	68.50	68.50	78.40
Culmen:	12.1–15	15, 15	13, 16	14.5–15.5	13.9–15
	13.41	15	14.50	14.83	14.42

♀♀ Wing; *plumosus* (Java): 80, 81, 82, 83, 84; *plumosus* (Leiden material, Java): 80, 81, 84, 84, 86; *plumosus* (Prince's Island): 81, 82, 83, 83, 84; *plumosus* (other islands Sunda Strait): 82, 82, 82, 84, 84, 84, 85, 85; *plumosus* (Udjung Kulon): 77, 80, 82, 84, 87; *plumosus* (Sumatra): 77; *plumosus* (Riouw Islands): 83, 83, 85; *sibergi* (Bawean Island): 82, 82, 83, 84, 85, 85, 85, 85; *billitonis* (Billiton Island): 82, 83; *porphyreus* (Sumatra): 83, 88; *hutzi* (Borneo): 80, 80, 80, 80, 86; *hachisukae* (Leiden material, Borneo): 79, 80, 82, 85;

Tail; *plumosus* (Java): 71.5, 71.5, 72, 75, 76; *plumosus* (Leiden material, Java): 69, 72, 75, 77; *plumosus* (Prince's Island): 68.5, 69, 69.5, 73, 78.5; *plumosus* (other islands Sunda Strait): 67, 67, 69, 70, 72, 72, 72, 72; *plumosus* (Udjung Kulon): 62, 71, 75, 76; *plumosus* (Sumatra): 70; *plumosus* (Riouw Islands): 75, 75, 75; *sibergi* (Bawean Island): 71, 72, 73, 74, 74, 75, 76, 78; *billitonis* (Billiton Island): 64, 73.5; *porphyreus* (Sumatra): 72.5, 75; *hutzi* (Borneo): 65, 67, 68, 70.5, 76.5;

Culmen; *plumosus* (Java): 12, 12.5, 14.5, 14.5, 15; *plumosus* (Leiden material, Java): 14, 14, 14, 15, 16; *plumosus* (Prince's Island): 13, 13.5, 14, 14.5, 15; *plumosus* (other islands Sunda Strait): 14, 14, 14.5, 15, 15, 15, 15.5, 16; *plumosus* (Udjung Kulon): 14, 15, 15.5, 16; *plumosus* (Sumatra): 14; *plumosus* (Riouw Islands): 14.5, 15.5, 16.5; *sibergi* (Bawean Island): 11.6, 11.9, 13, 13.6, 14, 14, 14.1, 14.9; *billitonis* (Billiton Island): 14, 15; *porphyreus* (Sumatra): 13.5, 15; *hutzi* (Borneo): 13, 13.5, 14, 14, 14.5.

Max., min. and average measurements

	plumosus						
	Java	Java, Leiden material	Prince's Island	Sunda Strait	Udjung Kulon	Sumatra	Riouw Islands
Wing:	80–84	80–86	81–84	82–85	77–87	77	83–85
	82	83	82.60	83.50	82		83.67
Tail:	71.5–76	69–77	68.5–78.5	67–72	62–76	70	75, 75, 75
	73.20	73.25	71.70	70.13	71		75
Culmen:	12–15	14–16	13–15	14–16	14–16	14	14.5–16.5
	13.70	14.60	14	14.88	15.13		15.50

	sibergi Bawean	*billitonis* Billiton	*porphyreus* Sumatra	*hutzi* Borneo	*hachisukae* Borneo, Leiden material
Wing:	82–85	82, 83	83, 88	80–86	79–85
	83.88	82, 50	85.50	81.20	81.65
Tail:	71–78	64, 73.5	72.5, 75	65–76.5	
	74.13	68.75	73.75	69.40	
Culmen:	11.6–14.9	14, 15	13.5, 15	13–14.5	
	13.39	14.50	14.25	13.80	

Some measurements compiled from literature

Chasen & Boden Kloss[5]; *hachisukae* (north Borneo):

9 ♂ Wing: 84–90 (island birds: 87–90; mainland birds: 84–86)
86.78 88.40 84.75

Tail: 75–84 (island: 79–84; mainland; 75–80)
79.67 81.40 77.50

8 ♀ Wing: 79–88 (island: 86–88; mainland: 79–85)
84.29 87.33 82

Tail: 68–81 (island: 76–81; mainland: 68–74)
75.25 79.25 71.25

Stresemann[9]; *hachisukae* (Banguey Island, north Borneo):
♂♂ Wing: 87–90
♀♀ Wing: 86–88
hutzi (northeast Borneo):
♂♂ Wing: 81, 82
♀♀ Wing: 78, 81, 84

Chasen[4]; *billitonis* (Billiton Island):
♂♂ Wing: 83, 83, 86; ♀ 80

de Schauensee & Ripley[8]; *porphyreus* (Islands off west Sumatra):
Nias Island; ♂♂ Wing: 81.5, 86
Batu Island; ♂♂ Wing: 88, 88, 90, 90, 90, 91, 91, 91.5 (average 89.94)
♀ Wing: 88.50
North and south Pagi Island; ♂♂ Wing: 84, 86.5
♀♀ Wing: 77, 78, 82

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On the avifauna of Australia*

by R. E. Moreau

I am here offering a preliminary account of some points about the Australian avifauna which interest me, particularly against the background of the Ethiopian and western Palaearctic avifaunas.

This has been made possible thanks to the fact that the Australian Academy of Sciences awarded me a Senior Scholarship which enabled me to visit the continent in 1963, and the Division of Wildlife Research gave me further generous assistance. I am glad to have this further opportunity of acknowledging my indebtedness not only to these bodies but also to the many individuals who helped and instructed me. Among them I must mention especially Claude Austin, Dr. H. J. Frith, Michael Ridpath and Dr. D. L. Serventy; and I am indebted to Dr. Serventy and Dr. S. J. J. P. Davies for criticizing the draft of these notes. A further paper on the avifauna of Tasmania (by Ridpath and Moreau) has been accepted for publication in *Ibis*.

Australia has an area of about 3,000,000 square miles, almost the same as the U.S.A. and as Europe. During the last glaciation, when the locking-up of water in the ice-caps lowered the sea-level by some 300 ft., both New Guinea on the north and Tasmania on the south were connected with the continent. It can be calculated that these connections would not have been broken until much later, about 12,000 years ago with Tasmania; 7,000 with New Guinea.

In its surface relief Australia is much the most uninteresting of the continents; half the entire area is within 1000 ft. of sea-level and nearly all the remainder within 2,000 ft. The only areas much above 3,000 ft. are in the extreme south-east and there has thus been little opportunity for any montane avifauna to develop.

The northernmost tip of the continent, Cape York, is at 10° S., the southernmost at 39° S., nearly two thirds of the surface of the continent being outside the tropics. An equivalent span of latitude north of the equator would be from Sierra Leone to north of Andalusia and climatically there is a close parallel, for both spans include a great high-pressure belt which gives rise to desert and semi-desert conditions. In fact by far the greater part of the continent receives less than 20 inches of rain a year and much of it less than 10 inches; higher rainfall is confined to a strip round the northern, eastern and south-eastern perimeter, with a small isolated patch at the south-western tip. These low annual averages do not, however, by any means tell the full story of Australia's climatic rigours. As elsewhere in the world, unreliability of rainfall increases as the annual average decreases, but in Australia the unreliability at every level is 10% higher than elsewhere (Leeper, 1960). As an extreme example, in places in New South Wales where in 1956 "sheep drowned in flood-water two feet deep, in the same paddocks at the same time of the year in 1957 the survivors died from starvation and lack of water" (Frith, 1962). This feature of the Australian climate is reflected in the bird life of Australia in three ways, namely, (1) a high degree of nomadism—most conspicuously perhaps in the ducks, (2) great fluctuations in numbers, (3) adaptation to irregular, opportunist breeding. This last has been well illustrated by Serventy & Marshall (1957). They showed that when heavy rain fell in south-western Australia out of season, 39 species of birds promptly nested, at a time of year when they would not normally have done so; and the response was greatest in that part of the area affected which has the lowest average annual precipitation. Of the other aspects the expedition through the west centre of Australia, from Perth and Kalgoorlie to Alice Springs, which I accompanied in July 1963, gave a good example. Although most of the continent had been having exceptionally good rains, along many hundreds of miles of our route the severe drought of past years had not broken, and we saw no Emus, only one party of Budgerigars, and less than a score of Columbidae, though much of the country we traversed would normally be suitable for them.

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* At the meeting held on 17th November, 1964, Mr. Moreau spoke on this subject.

As in other parts of the world, the climate of Australia has been subject to considerable fluctuations, but there is little detailed evidence of any kind except for the southernmost quarter of the continent (see especially the comprehensive review by Gentilli, 1961). So far as the Late Pleistocene is concerned, it can be said with certainty that there was a period when the climate was more humid than it is at present and another when it was more arid. The evidence for the first is mainly biological. At present the humid south-west corner of Western Australia is separated from the east by over 1000 miles of arid and largely treeless country. Yet with the exception of a single species, the parrot *Purpureicephalus spurius*, all the woodland birds inhabiting this humid "island" have close relatives in south-eastern Australia (see especially Serventy 1953, Serventy & Whittell, 1962). Still more cogent evidence is provided by so immobile an animal as the Koala *Phascolarctus cinereus*, dependent on certain species of *Eucalyptus* and now confined to eastern Australia, but found fossil in the south-west corner in the same caves as the remains of two important marsupial predators, the Tasmanian Devil *Sarcophilus harrisii* and the Tasmanian Wolf *Thylacinus cynocephalus*. All these three mammals had ceased to exist in the south-west corner before European man appeared. What caused their local extinction? If it was drought, a great wealth of endemic plants nevertheless survived, yet there is evidence of a dry period that affected certainly the Lake Eyre neighbourhood, and eliminated several giant marsupial species, as recently as 4,000–6,000 years ago (Gentilli, 1961). Moreover, something like half a million square miles of the southern and western interior of Australia are covered with sand-dunes that are now fixed by vegetation, albeit in places, it appears, only precariously. Hence there is a variety of evidence for at least the south-western half of the continent that the bird habitats have been subject to great vicissitudes in the last few thousand years.

Compared with the rest of the world the vegetation of Australia is very odd. The woody plants are practically all evergreen but a large proportion of them are perpetually shedding their bark, which flakes off or hangs in long, loose strips. Two groups, *Eucalyptus* with about 600 species and *Acacia* with 400, are dominant. In the absence of human interference, trees of these genera are extremely abundant over much of Australia. In a journey through the very dry country from Kalgoorlie to Alice Springs

I was struck by the fact that we were practically never out of sight of trees and for long stretches were travelling through woods of Mulga *Acacia aneura*. For most birds except honey-eaters (Meliphagidae) neither eucalyptus nor acacia trees are directly an important source of food. Plants bearing fruit with a soft pericarp or berries edible by birds are remarkably restricted, being abundant only in the tropical north-east, a fact immediately reflected in the distribution of fruit-eating birds. By contrast, the south-western half of the continent is almost wholly devoid of such fruit, as kindly verified for me by Serventy (*in litt.*). The fruits of *Eucalyptus* spp. are in hard woody capsules and those of *Acacia* spp. more or less like pea-pods, but the seeds contained in the latter seem to be eaten only by some parrots and pigeons. Another peculiarity of the vegetation is that the grass-seed is remarkably small and light. It has in fact been well said that the dice were indeed loaded against the Australian aboriginal, for the continent provided him with no animal worth domesticating and no plant worth cultivating.

Notwithstanding his limited culture, aboriginal man must have had an important influence on the vegetation through his use of fire to assist him in hunting. Moreover recent research has put back the date of his advent to Australia to 18,000 years ago (E. D. Gill, 1961) and perhaps even 25,000 (Tindale & Lindsay, 1963). The Dingo came much later; it has not been proved to occur on the continent more than about 6,000 years ago, presumably introduced by man, but thereafter it has no doubt had an adverse effect on ground-nesting birds. However, in some other aspects of the Australian environment the birds have been exceptionally fortunate; there was of course no squirrel nor monkey and no comparable predator, and there was no malaria. Another feature of the biological environment, in which Australia differs from the other southern continents, is that there is hardly any seasonal incursion of Palaearctic migrant land-birds; apart from waders, the only species that come in any numbers to pass the northern winter are two swifts.

European man has of course had a powerful effect on the vegetation. On the one hand over-grazing has led to grave deterioration of the vegetation over vast areas. Then, a great deal of woodland has been cleared for dairying enterprises (which rely on the establishment of imported grasses, since the nutritive value of the native species is so poor), for wheat cultivation (which has led to wholesale devastation of the Mallee, the exclusive habitat of that interesting megapode the Mallee Fowl *Leipoa ocellata*, monographed by Frith (1962)) or for other cultures, including orchard crops. Such changes are greatly to the detriment of most native birds, but there are certain compensations. One is that the extension of stock-keeping throughout most of the arid interior has led to a multiplication of dams and reservoirs fed by boreholes and these water-points allow some of the parrots and other birds to maintain themselves in places and during dry seasons where otherwise they could not. Also, while destruction of the trees catastrophically reduces the nesting-sites for birds requiring holes, in some localities, such as I saw in western Victoria, the present combination of circumstances is peculiarly favourable for a few species. Many old trees are left standing—though their days are numbered and there is no regeneration—while the pickings from the wheat farms provide an unprecedented supply of food, especially for Galahs *Kakatoe roseicapilla* and Sulphur-crested Cockatoos which can be seen abundantly round railway sidings. An unexpected new source of food has been provided by the "onion weed" pest of grain fields, a *Romulea* accidentally introduced from South Africa, the bulb of which is dug up by Galahs and Long-billed Corellas *Kakatoe tenuirostris* with great enthusiasm. Other beneficiaries among native birds are the Shelducks *Tadorna tadornoides*, which enjoy the green crops, and the crows *Corvus* spp., "magpies" *Gymnorhina* spp. and pipits *Anthus novaeseelandiae* which abound in cultivated pasture, probably far more than they ever did on any natural vegetation. It may be added that the Magpie Goose *Anseranas semipalmata* takes to rice cultivation so keenly that the bird may not be allowed to survive.

Excluding sea-birds and using the polytypic concept thoroughly, Keast (1961) arrived at a total of 531 species of birds breeding in Australia with Tasmania. More than one third of the entire avifauna is made up of only three families—50 parrots (Psittacidae), 64 warblers (Sylviidae), 67 honey-eaters (Meliphagidae). For an area of 3,000,000 sq. miles, with a range of habitat from desert to tropical rain-forest, 531 species is not an impressive total; for example, it is about the same as that of New Guinea, which has one-tenth the area, and less than that of Kenya, which has only one-twelfth. It is possible that the climatic vicissitudes of the Late Pleistocene have led to a higher proportion of extinctions than in the other areas. One spectacular casualty at least is known to have occurred, for it has recently been discovered (Miller, 1962) that after a long history in Australia flamingos (Phoenicopteridae) ceased to exist there late in the Pleistocene, perhaps eliminated by the "Great Arid" around 5,000 years ago.

From the ecological point of view the Australian avifauna presents a number of peculiarities, of which I find the following the most noteworthy.

(1) Scavenging birds are poorly represented in the avifauna; only the Wedge-tailed Eagle *Aquila audax* and the Whistling Eagle *Haliastur sphenurus* being much dependent on carrion, while the kite *Milvus migrans* and the crows (*Corvus* spp.) are, as elsewhere, pickers-up of unconsidered trifles. There is no equivalent of vultures or of the Marabou Stork *Leptoptilos*, omissions difficult to understand in view of the wealth of large marsupials.

(2) Aerial-feeding birds seem unaccountably few. There is no resident species of swift (Apodidae), though two from the north spend their off-season in Australia; and there are only four hirundines in the entire continent. There are, however, six wood swallows *Artamus* spp., one or more of which, foraging high, may to some extent take the place of swifts. There is one species of bee-eater, but only one.

(3) There is much migration northwards by non-breeding birds in the winter half of the year but it seems very incomplete. I was surprised to find, around the shortest day, the local swallow *Hirundo tahitica neoxena*, which is a close relative of *H. rustica*, numerous right down at Cape Leeuwin, the south-western limit of the continent, and also south of Perth a *Cuculus pallidus* feeding what was presumably its mate. And only a month later a Fantailed Cuckoo *Cacomantis pyrrhophanus* was present and calling on Philip Island near Melbourne. Such observations would not

be possible in a corresponding latitude in the Mediterranean basin, and even in Cape Province of South Africa, at exactly the Australian latitudes, the several swallow species and practically all the various parasitic cuckoos depart for the winter. The difference suggests that the winter supply of insects in the better-watered areas of southern Australia must be comparatively good.

(4) There is no woodpecker and a variety of birds to some extent fill the niche. The "heaviest" work in this connection is done by the big black cockatoos *Calyptorhynchus* spp., which bite clumsily and deeply into tree trunks. The so-called "tree creepers" *Climacteris*, of which there are several species with interesting interrelations, are specialists at tearing at and probing the abundant loose bark. This is explored also to some extent by other birds, for example, the currawongs *Strepera* spp., the shrike-tit *Falcunculus frontatus* and the nuthatch-like *Neositta chrysoptera*. It does, however, appear that no Australian bird is adapted to bore neatly and efficiently into tree-trunks; nor is any local bird equipped with a long probing beak such as is possessed by the wood hoopoes (Phoeniculidae) of Africa and has been developed—a beautiful example of convergence—by the passerine *Falculea* of Madagascar. Big grubs, such as the famous witchitty, the "bardee" of Western Australia, a favourite food of aboriginal man, certainly abound in Australian trees. It would be interesting to know whether in fact any important source of food, deep enough in the wood to be immune from all but the clumsy operations of the cockatoos, is being neglected.

(5) Insectivorous birds that feed by night seem remarkably sparse in Australia by the standards of other countries. They appear to be limited to two owls, one owlet-nightjar *Aegotheles* and three nightjars *Caprimulgus*, one of which hardly counts for the present purpose, since it is confined to the tip of the Cape York peninsula. Moreover I understand that nowhere except perhaps in the tropical north-east are large numbers of nocturnal birds encountered, either in the air or sitting on the roads, when one is driving with headlights, as they would be encountered in Africa. In addition to the birds cited, Australia possesses three species of frogmouth *Podargus*, which would naturally be supposed to come into this category and from the nature of their enormous mouths, to be aerial feeders no less than the nightjars. In fact there is no positive evidence that they are so (*cf.* B. E. Smythies *in litt.* for Asiatic birds), while Serventy has observed *P. strigoides* picking up food from the ground and has found mouse, scorpion, centipede and snail in stomachs. This raises an interesting evolutionary question; in its anatomy *Podargus* appears highly specialized for aerial feeding. Are appearances deceptive or has there for some reason been a change in the feeding habits of the whole group?

(6) The ecological niches occupied by larks and pipits, richly represented by many different species in much of the Old World, would seem to offer great opportunities throughout the vast open areas of Australia, but few species fill them. The only lark, *Mirafra javanica*, which extends across the Oriental and Ethiopian regions, is in Australia confined to the periphery and is absent from extra-tropical Western Australia. The sole pipit, *Anthus novaeseelandiae*, which has a world range even greater than the *Mirafra*, has shown itself extremely adaptable in Australia, for it occurs in

open country of every kind, including cultivation, even locally in the dry interior and on the moorlands above the timber-line on the mountains of the south-east. Two endemic birds which should perhaps be regarded as to some extent occupying lark-pipit niches are the "song larks" *Cinclorhamphus*, which are placed in the Sylviidae.

(7) The parrot family, with its 50 species, all but six endemics, shows an interesting radiation. The cockatoos, the biggest species, with the most powerful beaks, tackle seeds and hard fruits, while some also dig up bulbs and corms and others bite deeply into trees for grubs. There seems to be only one species of parrot that is primarily a fruit eater, dependent on figs in the tropical forest of north-east Queensland. But several species, with specialized brush tongues, are more or less dependent on nectar and hence of the local and specific flowering of eucalyptus trees. All the remaining parrot species, that is, the great majority, are primarily or exclusively seed-eaters, but from published accounts it is not at all clear what use they make of the seeds of either of the dominant genera of Australian trees, *Acacia* and *Eucalyptus*. Only the utilization of the Marri fruit, *Eucalyptus calophylla*, has been studied by Robinson (1960); the Twenty-eight Parrot, *Barnardius zonarius*, eats it when it is soft and immature and the King or Red-capped Parrot, *Purpureicephalus spurius*, later, when the seeds have developed.

(8) Other seed-eating birds are by no means numerous in the Australian avifauna, presumably because this niche is so well filled by the parrots. There is no finch, no bunting and no native ploceid weaver. There are indeed 18 estrildine weavers, but they are so strongly concentrated in the tropical part of the continent that only two are resident in the southern part of Western Australia, where native grasses are particularly scarce, and three in South Australia.

(9) Especially to anyone used to the ubiquity and abundance of the Columbidae in Africa, the status of this family in Australia is remarkable. The fact that in nearly 1,000 miles of interior Australia, from Kalgoorlie to Alice Springs in July 1963, less than a score of Columbidae of any sort were recorded impressed me greatly. Much of the distance was certainly drought-stricken, but by no means all. In fact, of the 22 species in the continent, no less than ten are birds of the tropical rain-forests and eight of these are fruit-eaters. Another ten species are birds of northern and inland Australia and two of these are restricted to the vicinity of rocky outcrops. Only two species, Bronzewings (*Phaps*), appear to range naturally to the south coast and in this southernmost part of the continent they do not form a numerous or conspicuous element of the avifauna.

(10) In conformity with the paucity and the geographical limitation of native fruits and berries, birds dependent wholly or mainly on fruit are restricted to the tropical north-east and, to a lesser extent, to the north-west. Taxonomically also they are remarkably restricted, for such species are found only among the Columbidae (8 species), the Oriolidae (mainly the two "fig birds"—*Sphecotheres*), one or two parrots and a single starling (Sturnidae; *Aplonis*), which only just enters the Cape York peninsula from New Guinea. There is no local equivalent to the Capitonidae (barbets), Bucerotidae (hornbills), Musophagidae (turacos) and no proliferation of starling species such as is so notable a feature in Africa.

It is worth drawing attention to the fact that although Australia is no such focus of primitive types in the Aves as it is in the Mammalia, it possesses three groups of birds with extraordinary biology, for which there is no parallel in other continents. The first two appear also in islands to the north.

(a) The bower birds (Ptilonorhynchidae), with their unique "architectural" and "artistic" ability, monographed by Marshall (1954).

(b) The mound-builders (Megapodidae), among which the Mallee Fowl has been specially studied by Frith (1962). From the ecological point of view it is of interest that, while mostly confined to the scrubby woodland in which Mallee *Eucalyptus dumosa* is an extremely strong dominant there, this bird is for months almost entirely dependent for food on the seeds of the acacias and cassias which form only one tenth of the woodland community.

(c) The lyrebirds (Menuridae), which though classed as sub-oscine on the grounds of their relatively simple throat musculature, have among the most superb and flexible vocal powers of any birds in the world. They are being adequately studied for the first time by the Division of Wildlife Research in mountain forest near Canberra, where distance-recording instruments of various kinds are being used to obtain continuous data on an exceedingly shy population. By contrast, the lyrebirds of the Dandenong forests, on the edge of the Melbourne suburbs, have become habituated to close human scrutiny to an extent that must be seen to be believed.

Features of lyrebird biology which are unusual are that they breed in mid-winter, when in some of their localities frost occurs, lay only a single egg, and at all stages of incubation leave it uncovered for long periods so that its temperature falls to that of the surrounding air. Among passerines the lyrebird may be unique in such resistance of the embryo to chilling.

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CONTRIBUTORS

Contributions are not restricted to members of the B.O.C. and should be addressed to the Editor, Mr. John Yealland, The Zoological Society of London, Regent's Park, London, N.W.1. These should be concise and typed on one side of the paper, double-spaced, with a good margin. The first time a species is mentioned, the scientific generic and specific names should be included. Subsequently the same name need only have the initial letter of the genus. Scientific names are printed in italics and should be underlined in the typescript. References should be given at the end of the paper.

Authors introducing a new name or describing a new species or race should indicate this in their title and display the name prominently in the text followed by *nom. nov.*, *sp. nov.*, *subsp. nov.* as appropriate. In these descriptions, the first introduction of the name should be followed by paragraphs for "Description", "Distribution", "Type", "Measurements of Type", "Material examined" and further sub-headings as required.

Proofs must be returned without delay. No changes may be made at this stage, other than corrections. At the discretion of the Editor, the Club will pay for a reasonable number of monochrome blocks, which the contributor may retain for his own use.

Contributors are entitled to a maximum of thirty free copies of the *Bulletin*, supplied only as specifically requested by authors. Those contributing to a meeting should hand in their MS. at that meeting; otherwise a note will be inserted mentioning the contribution.

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CORRESPONDENCE

Other correspondence should be addressed to the Hon. Secretary, Mr. C. J. O. Harrison, c/o The Bird Room, British Museum (Natural History), Cromwell Road, London, S.W.7.

DINNERS AND MEETINGS FOR 1965

16th March, 20th April (A.G.M.), 18th May, 21st September, 19th October, 16th November and 21st December.

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) SECTION

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BULLETIN

OF THE

BRITISH ORNITHOLOGISTS' CLUB

Edited by
JOHN J. YEALLAND

Volume 85
No. 4

April
1965

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British Ornithologists' Club

REPORT OF THE COMMITTEE

FINANCE

The Income and Expenditure Account which accompanies this report shows a very welcome return of the Club income exceeding expenditure, a surplus of £36 1*s.* 7*d.*, against a loss last year of nearly £300, most of which was of course due to the cost of the *Ten Year Scientific Index*. The improvement in 1964 was due to two main causes, a very large increase in the sales of old *Bulletins*, from £4 7*s.* 3*d.* to £77 6*s.* 6*d.*, and a decrease in the actual cost of the *Bulletin* of £33 1*s.* 6*d.* Other expenses were on balance little changed except for the sum of £26 5*s.* Surveyor's fee, incurred in connection with the Bequest of the property at Tring in the will of the late Herbert Stevens.

BRITISH ORNIT

INCOME AND EXPENDITURE ACCOUNT F

1963 £	EXPENDITURE	£ s. d.	£ s. d.
	Bulletin Vol. 84—		
	Cost of publication, distribution, etc.	567 11 3	
	Less Sales	171 0 8	
391			396 10 7
42	Notices, etc. for Meetings		45 15 9
274	Scientific Index		— — —
5	Audit Fee		5 5 0
5	Contribution *Zoological Record*		5 5 0
18	Expenses of Guest Speakers		5 13 4
7	Club Guests		6 19 6
16	Projectionist		20 0 0
44	Miscellaneous Expenditure and Postage ..		71 6 4
802			556 15 6
314	Excess of Expenditure over Income brought down		53 6 1
—	Transfer to General Fund		36 1 7
314			£89 7 8

BALANCE SHE

1963		£ s. d.	£ s. d.
	GENERAL FUND:		
	As at 31st December, 1963	1,324 19 11	
1,325	*Add* Transfer from Income and Expenditure Account	36 1 7	
			1,361 1 6
	BULLETIN FUND:		
—	Donations from Members		6 1 0
111	SUBSCRIPTIONS 1965 paid in advance		135 3 9
66	CREDITORS:		58 5 0
1,502			1,560 11 3
	TRUST FUND:		
	(The Capital of this Fund may not be used. The Income from it is General Revenue.)		
1,000	F. J. F. Barrington Legacy		1,000 0 0
£2,502			£2,560 11 3

C. B. WAINWRIGHT, *Chairman*
P. TATE, *Hon. Treasurer*

We have examined the above Balance Sheet and Income and Expendi
be in accordance therewith, and in our opinion correct.

FINSBURY CIRCUS HOUSE,
BLOMFIELD STREET, LONDON, E.C.2.
24*th February*, 1965

LOGISTS' CLUB

E YEAR ENDED 31st DECEMBER, 1964

1963	INCOME	£ s. d.	£ s. d.
	SUBSCRIPTIONS:		
332	Members	336 13 11	
2	Associates	2 2 0	
			338 15 11
50	Income Tax recovered under Deeds of Covenant 1963/64		60 16 6
	INVESTMENT INCOME:		
	General Fund	54 17 4	
104	Trust Fund	48 19 8	
			103 17 0
314	Balance, Excess of Expenditure over Income, carried down		53 6 1
802			556 15 6
—	Sales of *Scientific Index*		12 1 2
16	Sales of *Bulletin* for previous years, *less* expenses		77 6 6
270	Transfer from *Bulletin* Fund		— — —
28	Transfer from General Fund		— — —
314			£89 7 8

DECEMBER, 1964

		£ s. d.	£ s. d.
	GENERAL FUND, INVESTMENTS:		
	£1,000 4½% Defence Bonds, at cost	1,000 0 0	
	£100 3% Savings Bonds 1960/70, at cost	100 0 0	
		1,100 0 0	
1,080	*Less* Reserve	20 0 0	
			1,080 0 0
	(Market Value 1964: £1,084) (Market Value 1963: £1,089)		
1	PROJECTOR, LANTERN & SCREEN—Nominal Value		1 0 0
1	STOCK OF *Bulletin*—Nominal Value		1 0 0
	No value has been included for the stock of the Scientific Index		
420	CASH AT BANK		478 11 3
1,502			1,560 11 3
	TRUST FUND, INVESTMENTS:		
1,000	£1,399 11*s.* 0*d.* 3½% War Stock		1,000 0 0
	(Market Value 1964: £763) (Market Value 1963: £840)		
2,502			£2,560 11 3

unt with the books and records of the club and Certify them to

W. B. KEEN & Co.,
Chartered Accountants.

BULLETIN

OF THE

BRITISH ORNITHOLOGISTS' CLUB

Volume 85

Number 4

Published: 2nd April 1965

The six hundred and twenty-fourth meeting of the Club was held at the Rembrandt Hotel, London, on 16th March, 1965

Chairman: Mr. R. S. R. Fitter

Members present 25; Guests 10.

Mr. C. Mead spoke on Sand Martins, explaining some of the results obtained through a large scale ringing programme organised by the British Trust for Ornithology in which ringers in this country and elsewhere co-operated.

On the type-locality of *Campethera abingoni abingoni* (Smith), 1836

by P. A. Clancey

Received 9th November, 1964

It is generally agreed among systematists that Dr. Andrew Smith described his *Chrysoptilus Abingoni* on the basis of specimens obtained near Port Natal, *i.e.*, Durban, Natal, in the year 1832. However, reference to the original description of this woodpecker in the *Rep. Exped. Explor. Cent. Afr.*, 1836, p. 53, reveals that this is not so and that the generally adopted type-locality is completely erroneous. After introducing the name *Chrysoptilus Abingoni,* Smith gives an accurate description of the male, completing his original diagnosis with "Length 7½ inches. Occurs in the same localities with the last." Now, the ""last" in this instance refers to the species described immediately above *C. abingoni*, namely *Chrysoptilus Bennettii* (=*Campethera bennettii bennettii* [Smith] of modern usage), which "inhabits the country about and beyond Kurrichaine," *i.e.*, the Zeerust district of the western Transvaal. Arising from this observation, it is clear that the correct type-locality of the nominate race of *C. campethera* is the *Zeerust district of the western Transvaal*, and not Durban, Natal. The mistaken belief that the paratypical material of the Golden-tailed Woodpecker came from Durban arose from the fact that immediately below the original diagnosis appears a footnote, stating, "Specimens of this species were obtained near Port Natal in 1832," which, when taken in conjunction with the geographical ascription of "the country about and beyond Kurrichaine" in the description, implies that when describing the species Smith had seen material from both Natal and the western Transvaal. The 1836 description is, however, quite unequivocal and refers to the western Transvaal population and not that of Natal.

The above finding necessitates two changes of name to South African forms of the Golden-tailed Woodpecker as laid down in my revision of these in *Bull. Brit. Orn. Club.*, vol. 79, 5, 1959, pp. 70–78. Form (c) of my revision becomes the nominate race, with *Picus* (*Chrysoptilopicus*) *Smithii* Malherbe, 1845, an absolute synonym, and for form (a) a name is required. For the innominate austral subspecies I propose

Campethera abingoni constricta, nom. nov.

pro. C. a. abingoni (Smith) of Clancey, *loc. cit.*, *et auctorum*, *nec* Smith, 1836. *Type* from Gillitts, near Kloof, Natal, alt. *c.* 2000 ft. a.s.l. 25th April, 1953; collected by B. B. Rawdon. In the collection of the Durban Museum, Reg. No. 12987. Wing 111 mm.

The name chosen is descriptive of the narrowed and constricted nature of the lower throat and pectoral striae as compared with those of the nominotypical subspecies.

A further case of dwarfism in a pheasant

by J. S. Ash

Received 4th January, 1965

An example of a dwarf cock Pheasant (*Phasianus colchicus*) from Oundle, Northamptonshire, has been described in this journal (Ash, 1961). Another rather similar bird was shot on about 19th December, 1964, on the Portway Estates, near Whitchurch, Hampshire, and sent to the Game Research Association for examination through the kindness of Mr. A. A. L. Wills.

Like the earlier bird there was no evidence of disease or injury, the testes were normal in appearance and there were good deposits of subcutaneous and visceral fat. There was no evidence of emaciation. Its standard measurements are compared with those given from *The Handbook of British Birds* and for the Oundle bird cited above:—

	Measurements in mm.		
	The Handbook	*Oundle bird*	*Whitchurch*
Wing	235–260	219	215 and 216
Tarsus	60– 78	50	45 and 45
Bill (from feathers)	28– 32	26	21.5
Tail (central)	420–520	419	356
Weight in gms.	1394	510.3	426.5

Based on wing moult the present bird was 17–18 weeks of age (1st primary = 98 mm.; longest (4th) primary = 162 mm.) which means it was a very late hatched bird in the third week of August. If the possibility is taken into account that late hatched birds develop more slowly the hatching date would almost certainly still have been some time in August.

Macroscopic examination of the thyroid and pituitary failed to indicate anything that might have contributed to the bird's condition. However, these glands have been preserved in 10 per cent saline formalin and are available to anyone who may wish to study them further.

Reference:
Ash, J. S. (1960). Dwarfism in a Pheasant. *Bull. Brit. Orn. Club.* 81: 95–96.

First-year Starling retaining juvenile flight feathers and comments on post-fledging moult

by R. E. Scott

Received 19th November, 1964

Unlike the majority of passerines, the Starling, *Sturnus vulgaris*, undergoes a complete post-fledging moult commencing in early June, when the grey-fawn plumage of the juvenile is replaced by the adult-like feathers of the first-winter bird. Occasional examples retain a small number of juvenile feathers about the head, particularly on the ear-coverts or immediately above the eye. On 30th October 1964, at Dungeness, Kent, during the routine trapping and ringing activities of the bird observatory, I handled a first-year starling that was in the final stages of moult. All the flight feathers were renewed except the outermost (minute) primary and the innermost secondary; both of which had completed two-thirds of their growth. The exceptional feature of this individual was that the first and third secondaries on the right wing and first on the left wing were retained juvenile feathers (secondary numbering ascendant).

A total of 819 first-year Starlings have been examined at various stages of their moult at Dungeness since 1961, a considerable number being captured on more than one occasion as the moult progressed. Not one of these birds showed any indication of flight feathers being retained, although a certain percentage (nearly 50% in 1964) were not half-way through the moult process when examined. A careful check during September and October 1964, of first-year Starlings that had completed their moult (a total of 209 individuals) revealed that apart from the bird described above, none had retained any juvenile flight feathers.

DISCUSSION

Williamson (1961) states that occasionally the juvenile bastard-wing and up to three secondaries may be retained and records one individual which had retained the innermost tertial, median coverts and secondaries number four to six. Clearly, however, the numbers given above show that the retention of juvenile flight-feathers (tertials, secondaries and primaries) is of unusual occurrence in the Starling. Witherby *et al.* (1940) record complete post fledging moult in only sixteen members of the Passeriformes —eight Alaudidae; *Aegithalos caudatus; Panurus biarmicus; Sturnus vulgaris; S. roseus; Emberiza calandra* and three Passerinae. At the present time there would appear to be no clear cut explanation why some species undergo a complete moult from the juvenile plumage, while in others it is only partial. The fact that *Emberiza calandra* is the only member of a large genus to replace all its feathers is particularly interesting. The amount of moult at this age is by no means consistent within a species, and the instability of this feature provides scope for work upon affinities and evolutionary characters that could be of considerable value to the systematist.

References:
Williamson, K., 1961. Sequence of Post-nuptial Moult in the Starling. *Bird Migr.* II. 43–45.
Witherby *et. al.*, 1940. *The Handbook of British Birds*, London.

Some remarks on an anomalous gull

by James M. Harrison

Received 24th December, 1964

On 20th September 1964 a gull was observed on one of the ballast waters in the Sevenoaks area which it frequented between that date and 5th October.

Its field characters were so extremely anomalous, and as both races of the Lesser Black-backed Gull, i.e. *Larus fuscus fuscus* L., and *L. f. graellsii* A. E. Brehm are regular and common visitors and passage migrants to the water, it was possible to make frequent comparisons under good conditions. As at no time during the above period was it possible to make a definite field determination, it was decided to collect the bird which is a female.

In life the following points were noted; firstly the mantle lacked the intensely black quality of the Scandinavian Lesser Black-backed Gull and appeared to be somewhat lighter than that of the British form of that species, though it was much darker than the mantle of the Herring Gull.

Secondly, and quite the most striking of the field characters presented by the individual was the very dark and heavy striations of the head and neck, and these markings extended on to the breast. In the field, when at rest with its head down on its shoulders, it had the appearance of having a white collar.

In size, in the field, it seemed to be about as large as a Lesser Black-backed Gull. Its bill was yellow with a bright red spot on the gonys, and the legs and feet were putty-coloured. There appeared to be several such individuals, but less strongly marked. This last circumstance finds support in the fact that a bird of this type was observed in the same area during the last three months of 1964.

The problem presented of course as to whether or not one of the eastern forms of the *Larus argentatus—L. fuscus* complex was involved.

In view of the lack of such material in this country it was decided to submit the skin to Professor K. H. Voous for his opinion and it was also sent to Dr. Goethe for opinion. Professor Voous studied this bird most carefully and came to the conclusion that it was definitely of no known *Larus* species or race of that genus, in fact he wrote "a gull like yours should not exist, indeed it *does* not exist. Bird watchers should congratulate themselves when never seeing a gull like this: it would give them nightmares, for it is not identifiable." Voous states that its wing is too small for *Larus fuscus heuglini* and the bill is too short and too thin; also that the mantle lacked the dull grey tinge of the North Siberian gulls, and that the striations of the head and neck were too heavy. He points out that the colour of the legs does not suggest pure *heuglini*, and that "gull populations intermediate between yellow-legged *heuglini* and the eastern *birulae* or *vegae* with flesh coloured legs, tend to be larger still, with more heavy beaks and mostly lighter mantle coloration." The North American *L. occidentalis* which has a somewhat similar mantle colour is, however, again even larger. The shortest bill (exposed culmen) in the American species is 51 mm., whereas the anomalous specimen is only 47.5 mm. Nor does *occidentalis* ever develop such a heavily striated head. Other forms of the *L. argentatus* complex such as *michahelles* and *atlantis* are larger still and have much heavier bills, bright yellow legs and never such heavily striated heads.

Professor Voous writes "Still, your bird definitely belongs to the *argentatus–fuscus* group on account of the grey 'tongues' on the inner webs of the outer primaries, also the red spot near the tip of the lower mandible is indication of its relationship.

When no 'pure' forms or species can be found to match with a specimen, the question of a hybrid has to be considered. This is the more hazardous as you wrote me to have observed at least four specimens of gulls of this kind. Still at present I see no other possibility."

Continuing, Professor Voous stresses the following points:—

(1) the dark, *bluish*-grey tinge of the mantle, which could not be matched with any member of the *argentatus–fuscus* group.
(2) the thin, slender and short bill.
(3) the colour of the legs, in tone somewhere between flesh-coloured and yellow.

The above strongly suggest a hybrid which could have resulted from the reciprocal cross between *argentatus* x *fuscus*, the size being small (though not too small).

Professor Voous thinks, however, that it is more likely that *L. fuscus* subsp. x *L. canus* is involved.

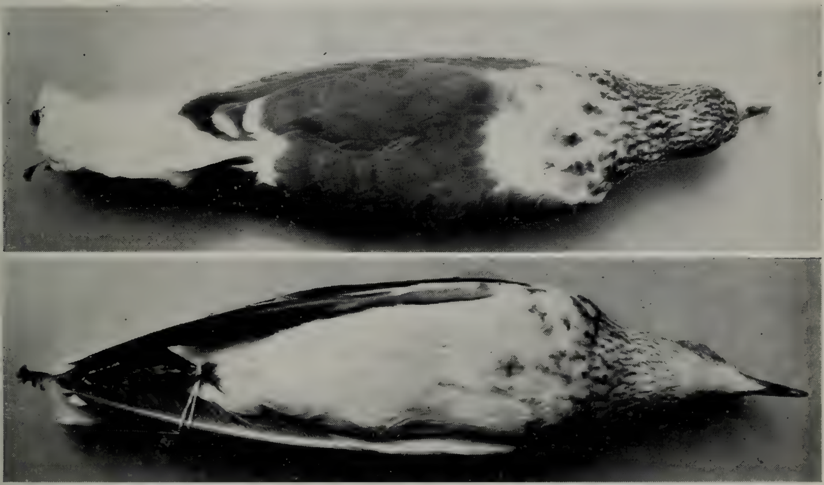
However, he writes "But I am fully aware that it is most unlikely that three or four hybrids have turned up and have kept together throughout at least four years of their lives."

Dr. Goethe makes the following comments (*in litt.* 31. vii. 64) "Indeed, this is an odd bird, and I examined it for many hours before I read Dr. Voous's opinion. It is funny that my first idea was a hybrid between Common Gull and Lesser Black-backed Gull because of the extraordinary dense mottling. It is known that the eastern subspecies of *L. canus* (*L. c. heinei* or *major*) in its winter plumage is heavily striated. But I can't imagine that this very dark subspecies of *L. argentatus* or *L. canus* can be one of the parent species. That there appeared to be others of similar type makes it difficult to think in terms of a hybrid individual. On the other hand the colour of the legs and the relatively late moult, together with the other circumstances support the possibility of a hybrid."

With reference to the presence of several of the same type. Believing that various breeding colonies of the two species exist in proximity probably along an extensive coastline to the north-east of the British Isles, and that at points along this line possibly more than one such hybrid pair might exist, and furthermore, probably all the individuals of such breeding hybrid pairs would travel along the same migratory route to the south-west, then the possibility that several such hybrid progeny might converge, meet, and be observed in company in one place is not so very unlikely, and they need not of course be actual siblings in this case, but merely birds of similar genetic constitution from a similar broad breeding area, meeting by chance on the same migratory path.

This hypothesis, as already stressed, would appear to be supported by the observation of another such individual being seen in the same locality about a year later, when incidentally its characters had become accentuated by virtue of an added year!

From the valuable opinions given above, and taking into consideration the highly suggestive characters presented by the specimen and its quite anomalous appearance in the field, it would seem that hybridisation offers the best explanation.



Anomalous gull ♀ 5th October, 1963, Sevenoaks.

In support of this there is the paper by Steinbacher (1938) in which a cross between these two species is recorded. In this instance hybridisation between a Common Gull, *Larus canus* Linnaeus and a Lesser Black-backed Gull, *L. fuscus fuscus* L. occurred in the Berlin Zoological Gardens in two consecutive years, *i.e.* in 1935 and 1936; one young bird from each season was reared. In this paper (see Plate IV, Fig. 5) an adult of this cross is seen with an adult *L. f. fuscus*. The photograph was taken during the summer, and shows the comparative darkness of the mantles of the hybrid and the adult of the Lesser Black-backed Gull.

The characters of the Sevenoaks specimen are shown in the accompanying plate.

The measurements in mm. of this specimen are as follows:—

w. = 400
b. = 47.5
t. = 63
tl. = 146

ACKNOWLEDGEMENTS

I would express my indebtedness to Dr. Jeffery Harrison who collected the specimen, and to Dr. Pamela Harrison for the photograph.

My debt to Professor K. H. Voous and to Dr. F. Goethe, is obvious, for the very exhaustive comparison with all other possible forms which were relevant to the problem, and for their carefully considered opinions, which quite independently reached the same conclusion.

Reference:

Steinbacher, G., 1938. "Zur Ethologie unserer einheimischen Mövenarten". *Ber. des Vereins Schlesischer Ornithologen*, Heft 3/4, pp. 42–46.

The nesting, eggs and young of the Saddle-bill Stork, *Ephippiorhynchus senegalensis* (Shaw)

by CHARLES R. S. PITMAN

Received 24th November, 1964

Although the Saddle-bill is widely distributed through much of Africa south of the Sahara, twenty years ago little had been recorded, and little was known, about the eggs.

Such information as was then available appears to have been based to a great extent on three eggs at the British Museum (Natural History), two of which from the Gould collection (made in South Africa) are unmistakable eggs of the Secretary Bird, *Sagittarius serpentarius* (Miller) measuring 78.4 x 57.4 mm. and 77.0 x 56.4 mm., are end blown and damaged; the other purchased from Taylor is of a Saddle-bill and a much damaged specimen, dimensions approximately 76 x 58.3 mm.

Schönwetter (1960) referring to these eggs at the British Museum (Natural History) comments that they have more the appearance of the eggs of *serpentarius* which they resemble in outline and that they are more tapering than those of other storks.

The British Museum eggs are referred to by Stark and Sclater (1906), Bannerman (1930), Priest (1933) and Austin Roberts (1940), but there is no reference to them in Jackson (1938). Chapin (1932) quotes Heuglin (1873), who found the Saddle-bill breeding on the Upper Nile in January and February, on acacias in the midst of swamps—the eggs dull white and of coarse texture, measuring 76–80.5 x 56–57.5 mm.: Nehrkorn's (1910) bare reference to the egg of this stork "80.5 x 57.5 mm. Central Africa" is presumably based on Heuglin's eggs.

Priest (1948), referring to Southern Africa "Breeds in June and July" and the nest "is built in very tall trees, alongside the big rivers . . . a large structure is firmly built on to stout boughs" which is not particularly explicit. The eggs are "Dull white, coarse in texture and slightly glossed", and measuring "77 x 57 mm.; 76–80.5 x 57.5 mm." (the latter presumably are Heuglin's measurements). Mackworth-Praed and Grant (1952) refer to "A large stick nest in trees", coupled with the inaccuracy "Egg one". The egg measurements "about 78 x 57 mm." and the description "dull white, covered with minute pores" are similar to what Priest (1933) records "according to Sclater". Further, Praed and Grant record breeding White Nile in November, January and February (the last two presumably attributable to Heuglin, and the first from myself); Northern Abyssinia, November; Uganda, June (my own record); and Nyasaland, probably August. Bouet's (1955) reference to a dirty white egg, slightly glossed and covered with minute pores and measuring 77 x 57 mm., seems to have been copied from Bannerman (1930), Austin Roberts (1940) and others. Up till 1952 the published data appear to have been confined to the somewhat ancient material of Heuglin and of the British Museum (Natural History).

The records which follow—the great majority hitherto unpublished—are arranged according to territory. None of value appears to be available from the Congo.

WEST AFRICA. According to Bouet (1955), in January 1916, near Boghé, in Senegal, on the Senegal river, a pair of Saddle-bills were seen carrying materials to a nest which had been built on an enormous Silk-Cotton Tree, *Eridendron anfractuosum*. This is the only breeding record so far available from a vast region.

SUDAN. In the localities of the Southern Sudan where this stork is fairly common and trees are relatively scarce the nest is easier to find than in the well-treed regions of Eastern, South Central and South Africa, where this bird is widely distributed and may be locally common. During the war years 1941–1945 when Sudan Government officials were perforce taking their leave in the East African territories, the writer was able to contact reliable field naturalists who were prepared, if possible, to assist in obtaining some Saddle-bill eggs. The result was rewarding:— c/2 (one broken) collected on 3rd November 1943 were in an advanced state of incubation and would probably have been laid in early October—the surviving egg measured 84.5 x 62.0 mm.; c/3 collected on 14th September 1944, one of which was broken, measure 80.3 x 57.3 and 82.8 x 58.3 mm.; and c/3, incubation advanced, obtained in April 1945, measurements 80.3 x 55.3, 79.0 x 57.2 and 81.0 x 56.2 mm. The indications are that in the Southern Sudan the breeding season may extend from September till April.

UGANDA. The breeding season in adjacent northern Uganda is not so prolonged and according to various correspondents and from my own records (two juveniles on 1st March able to fly), seems to extend from November (or October) to February (or March). Observations from this region, both east and west of the Nile, all refer to juveniles, out of the nest (from eggs which would have been laid in November, December or early January); these juveniles would be strong on the wing before the rains set in during April. A nest, not far from the Murchison Falls, which is occupied year after year, is a colossal pile of sticks on the flat crown of a tall tree.

In the Lake Edward and Lake George region of western Uganda, where the climatic conditions are different from those in the north, the Saddle-bill nests during May–June. On the east side of the Kazinga Channel, which connects these two lakes, and about halfway between the causeway across the Channel and Lake Edward, a Saddle-bill's nest was found, in the latter part of May, at the top of a 25-foot high *Euphorbia dawei*—a

Nest of Saddle-bill Stork in Uganda on *Euphorbia dawei.*

single, straight stem crowned with a rounded head of angular branches which could be overlooked from the high bank and from which the sitting bird was photographed. Unfortunately, although the eggs were on the point of hatching, the bird deserted and the abandoned eggs were collected on 11th June, they measured 83.3 x 56.2, 84.2 x 58.0 and 86.3 x 59.0 mm. and were successfully cleaned by the finder who neatly cut out—how I do not know—a circular piece of shell some 15 mm. in diameter (which was eventually replaced), thus enabling the chick to be removed. From south western, southern and eastern Uganda, and from Uganda's Lake Victoria region I have no reliable information about the breeding season.

KENYA. J. G. Williams (1963) calls this stork rare in Kenya, "except at Amboseli National Reserve where several pairs breed." He has never seen a nest there but suggests that the breeding season may be in May and June. A nestling has been obtained from the general region of Amboseli in early July.

TANGANYIKA (now TANZANIA). In the Western Serengeti region Myles Turner (*in litt.*) on 27th June 1962 found a Saddle-bill nest high up (about 60 feet) on top of a 'yellow' acacia thorn tree, *Acacia xanthophloea* on the Upper Seronera river. The large construction of coarse twigs and sticks was very similar to a vulture nest. It contained three large nestlings which were stretching and testing their wings. To do this they would stand up facing into the wind and jump up to about two feet in the air flapping, with wings outstretched. According to Bannerman (1957) the nestlings of the White Stork, *Ciconia c. ciconia* (Linn.) commence to exercise their wings when three weeks old and continue doing so until they start to fly when 58 to 67 days old, so in the case of the

Saddle-bill nestling wing-flapping is unlikely to be an indication of a specific age.

Most of the time one parent was usually on the nest, which appeared large and deep enough to conceal the four birds when they settled down. Two days later one of the juveniles had left the nest—whether it fell or successfully took off is not known—and was found fit and well by the river a mile away. It was observed to be feeding on its own along the Seronera pools.

In late June 1963, Turner saw a pair of Saddle-bills with two fledglings at a small lake eighteen miles south-west of Seronera and in early July he found the remains of one of these juveniles by this lake. As he had noticed that at this stage of their development the young birds appeared to be able to fly only about 60 yards without alighting he is therefore of the opinion that this mortality was probably due to the young bird being chased and caught by a predator. He also mentions that Saddle-bill juveniles, when unaccompanied by their parents, can at a cursory glance easily be mistaken for young Marabou Storks.

NYASALAND (now MALAWI). In July 1945, a reliable village headman, in the north of the Mzimba district, showed W. S. Gray (a Veterinary Officer) a huge stick nest—said to have been lined with grass—which contained eggs about January, some 45 feet up in a *Copaifera mopane* and 75 yards distant from a stream. This nest had been built and occupied by a pair of Saddle-bills in 1944, probably in January; and after nesting early in 1945 the birds in December returned to the nest which they seemed to be repairing, but they soon left not to re-appear (communicated by Benson). Long (1960) records that in the Port Herald district on 5th January 1953 he watched a Saddle-bill gathering sticks and mud from the sudd and flying with them into Portuguese territory.

NORTHERN RHODESIA (now ZAMBIA). Brelsford (1942) recorded the Saddle-bill as common all the year along the Chambeshi River, in Northern Rhodesia and according to native information breeding in August and September, usually having two young—an interesting observation, if accurate, on possible average survival rate. Symmes and Bromley (1953), referring to the same territory, record that on 1st and 2nd June 1952, two adults and three young were seen regularly on the Kafue flats at Mazabuka (the eggs perhaps laid in February or March).

Benson and White (1957) provide comprehensive breeding records from Northern Rhodesia—an occupied nest in May, recently fledged juveniles in early June, young just capable of flying in October and laying at Bangweulu in November and December; more recently, Benson, Brooke and Vernon (1964) tabulate the available breeding (egg-laying and young in nest) information—two records in April and one each in May and June.

Most of the Northern Rhodesia records refer to juveniles and the series of observations by Benson and Pitman (1958) suggest egg-laying may take place from the latter part of March till June; references to juveniles under parental care include—two juveniles (once), three (thrice) and four young (twice). Later, Peter Steyn (1963) when in the Kafue National Park at the end of August, 1962, saw one large nestling, perhaps two, in a nest "on top of a pillar-like growth of thick creepers and bush growing on an ant hill, and also "a pair of saddle-bill storks with two young recently out of the nest".

On 17th May, 1959, near Kariba lake, in a locality soon to be inundated, B. Hellam (1960) found c/3 Saddle-bill, in a very advanced state of incubation, in a nest at the top of an acacia tree. The eggs, measuring 84.3 x 60.0, 81.2 x 61.0 and 83.2 x 61.0 mm., have rather heavy shells and are white (one slightly nest-stained) with a fine matt surface (or texture), so typical of storks' eggs, and rather glossy—more so than usual.

In addition, Benson (*in litt.*) has most generously made available for my purpose the unpublished records of twenty-five broods—which with others are critically examined later—from observations made, principally in the Kafue National Park, during the period July 1958 to October 1964, as well as providing references to a nest containing two eggs which was viewed from the air and another which was inaccessible in which a bird was brooding.

SOUTHERN RHODESIA (now RHODESIA). Priest (1942) in mid-September, observed two young Saddle-bills, together with an older juvenile, all three were later fed by the parents; and Smithers, Irwin and Paterson (1957), for the same territory, record breeding in February; more recently, Benson, Brooke and Vernon (1964) tabulate three breeding records for February and four for March. In the Southern Rhodesia waters of Kariba Lake, according to H. Miles (*in litt.*) (and a Southern Rhodesia Nest Record Card), c/4 downy young were rescued on 6th April, 1959 from a Saddle-bill nest threatened by the rising waters and successfully reared; nearly six weeks later, on 20th May, they were still unable to fly.

Valuable data are also available from nine other Southern Rhodesia Nest Record Cards which indicate nesting from 10th February to 14th July. There are three February records—c/3 on 10th February; c/4 on 23rd February; and birds incubating on 25th February, but it was not possible till 7th March to ascertain that this nest contained four eggs, on 5th April (4?) very small chicks were in the nest, and on 21st May the young (4?) had left. One March record—c/3 on 9th March, which later hatched into three chicks. One April record—c/3 and one nestling on 5th April; these had been reduced by 15th April to three nestlings and by 21st May there were only two, which were ringed; one was found dead on 1st August some time after they had left the nest. Two May records— three juveniles in a nest on 2nd May, and four juveniles on a nest on 15th and 16th May. Two July records—three two-thirds grown juveniles still in the nest on 13th July and two fledglings accompanied by both parents on 14th July.

SOUTH AFRICA. According to Roberts Revised (1957), in February, the Saddle-bill breeds in the Northern Transvaal, on the larger rivers, mostly on high trees on the river bank, laying three dull white eggs, slightly glossy and coarse in texture—measuring 78.5 x 56.2, 77.3 x 56.0 and 76.1 x 56.2 mm. *Vide* Clancey (1964) "in the Transvaal is recorded as breeding in June". Two adults and a juvenile on a nest on 3rd July 1956 are data taken from a South Africa Nest Record Card.

BROOD SIZE and SURVIVAL RATE. Clutch size north of the Equator seems usually to be limited to three eggs from which often only two juveniles survive; in Northern and Southern Rhodesia a set of four is frequent and three juveniles with or without parental care are unlikely always to represent 100 per cent survival for sometimes they may indicate a loss of one out of c/4.

Judging from the size of broods as observed under parental care, the survival rate of broods prior to fending for themselves appears to be encouraging.

There are many more records of nestlings or of fledglings, alone or with one or both parents, than there are of eggs. Juveniles, once out of the nest are easy to see, whereas the brooding bird on a well-concealed nest, more often than not inaccessible at the top of a lofty tree, cannot be seen from the ground and a nest is not easily detected as the bird sits very tight. Attwell (Game Department Report), however, has pointed out that the parent has the "usual dirty habits of storks" and the ground below a nest, and the nest itself can be spattered with droppings, which could draw attention to a nest.

I have been able to examine a total of fifty breeding records—eggs, nestlings and fledglings—from Tanganyika (two), Northern Rhodesia (37) and Southern Rhodesia (ten) and South Africa (one). Twenty-six of the Northern Rhodesia records are from the Kafue National Park and another four from the neighbouring Kafue region; from Southern Rhodesia six are from the Wankie Game Reserve and three from Kariba lake.

Three of these 50 records refer to eggs, one set of four and two sets of three each; of the remainder, 42 are broods, mostly after they have left the nest—either with or without parents—and include c/3, all the eggs hatching; and five broods are indeterminate—c/4, the number hatched and which left the nest uncertain, but probably four; c/3 and one nestling, which ten days later were reduced to three nestlings, and five weeks later to only two; c/2 observed from the air (which may have been an incomplete set); an occupied, inaccessible nest, its contents not known; and a nest containing one or two large nestlings.

Young birds which have left the nest are referred to as fledglings or juveniles and the broods under reference were either accompanied by one or both parents, or unaccompanied.

Table of brood sizes

	Accompanied by one or both parents or in the nest				*Unaccompanied*					*Total*
Brood size	4	3	2	1	5	4	3	2	1	
Number of broods	(b) 5	(c) 10	8	(d) 7	(a) 1	2	4	4	1	42

(a) So large a brood as five is abnormal, but a reliable observer saw five fledglings together, not yet strong on the wing and unaccompanied by parents. In the absence of any conclusive data comment on this outsize brood would be superfluous, though the reference by Priest (1942) to two young Saddle-bills together with an older juvenile, does suggest the possibility of broods joining up.

(b) Includes three broods still in the nest.

(c) Includes four broods in the nest.

(d) Includes three nests each containing a single nestling. Commenting on the tabulated figures, sets of eggs or broods of four are frequent. Three eggs may constitute the normal clutch size, though two c/3 and 14 records of three-size broods (four of which were unaccompanied by parents) out of a total of 42, are inconclusive. As previously mentioned, two juveniles—which may be the survivors from c/3 or c/4—seem to indicate an almost certain measure of egg wastage or juvenile mortality; of the 12 records tabled, four are of unaccompanied broods. The extent of possible juvenile mortality (or egg wastage) is further emphasised by the eight single juveniles (one unaccompanied) listed.

Juvenile mortality (or egg wastage) evidently can be considerable, though not disastrous, and seems to have occurred in about 48% of the 42 broods under discussion and the overall loss may amount to about 30%, which is not excessive.

Some interesting facts emerge from these brood data; one unaccompanied brood of three was estimated to have left the nest only one week previously—so why were they alone? Similarly, two unaccompanied fledglings had recently left the nest; another two, also unaccompanied, could only fly a few yards at a time; and two very young ones observed on 18th November constitute an unusually late record—perhaps a July or August laying?

Some of the 'single' observations merit special attention: a fledgling, with its parents, had obviously just left the nest—when and how did the loss of the other members of the brood occur?; there are two instances of one down chick (one about three weeks old) and also of one juvenile in a nest—to what was the possible mortality per nest attributable?; and, what would account for an 'unaccompanied' juvenile not more than ten days out of the nest?

INCUBATION, NESTLING and FLEDGLING PERIODS. In this context the fledgling period refers to the time after the young birds have left the nest until the brood eventually separates.

On the assumption that the incubation and nestling periods of the Saddle-bill are likely to differ little from those of the White Stork and following Bannerman (1957), the period of incubation of the former is probably about four weeks and that of the nestling a further eight to nine weeks. But as the Saddle-bill eggs average (82.5 x 58.5 mm.) a good deal larger than those of the White Stork (73.2 x 51.81 mm.) it is possible that the incubation period may be longer. It is not known whether the eggs are laid every other day; in the sultry conditions of Africa incubation probably commences as soon as the first egg is laid.

E. Davison, the Warden of the Wankie Game Reserve in Southern Rhodesia has a record of Saddle-bills incubating on 25th February; four eggs were counted in this nest on 3rd March and very small nestlings were seen in it on 5th April. This suggests an incubation period of about five weeks. These young left the nest on 21st May, approximately seven weeks after hatching. According to Davison an observer estimates the incubation period of the Saddle-bill to be 42–48 days and the nestling period 46–48 days, these combined periods thus varying from about 12½ weeks to about 14 weeks, which differ little from the similar combined periods—12 to 13 weeks—of the White Stork. But I consider that this estimate of the incubation period is too long and that of the nestling period possibly too short. For instance, four downy young found on 6th April which still could not fly on 20th May would probably have been nestlings for at least seven weeks, as also would have been young which started hatching on 5th April and were still in the nest on 21st May. There is also the record of downy young—their age not stated—which six weeks later were still unable to fly, but these had been reared in captivity.

The down chick of the Saddle-bill is described as white, woolly or fluffy, with a blackish or horn-coloured bill. At three weeks old it is still in this plumage and the bill is only 3½ inches long. It is not clear at what size, in relation to that of the adults, the nestlings leave the nest, but when half-grown they are still in the nest; and from Southern Rhodesia there is a reference to nestlings "two-thirds grown". When they leave the nest, and for a few weeks after, the head and neck remain white and woolly and the bill blackish. A half-grown fledgling observed on a nest on 29th August was seen to be under parental care in the vicinity of the nest on 15th September; a parent sitting on 3rd April (on what?) was seen to have four half-grown nestlings on 4th May.

Benson and Pitman (1958) refer to fledged young in various stages of growth in which the young did not show "any red on the bill or legs, which were wholly black, while the areas which are black in adults were mainly dark grey, and those which are white were pale grey." At what age or stage the individuals of a brood separate has not been recorded, but they are still together when the red colour is appearing on the bill and when the yellow 'saddle' begins to show. It is not known at what age these changes take place. It is evident from Turner's observation that the young Saddle-bill is able to fend for itself immediately after it has left the nest, which is supported by a Northern Rhodesia record of a juvenile on its own "not more than ten days out of the nest".

Other observations such as "obviously just left nest", "only recently left nest", "believes left nest one week ago" and "not out of nest more than ten days ago" are presumably based on the limitations of the young birds' powers of flight, as have been referred to by Turner. However, according to Benson (*in litt.*) J. M. C. Uys does qualify a record of an unaccompanied "very young juvenile not out of nest more than ten days" by basing his calculation on "the state of the wings and it was covered with a blackish down unlike an adult bird" (Benson suggests the "blackish down" refers to feathers).

NEST CONSTRUCTION, SIZE and SITE. The data available indicate that the nest is usually, if not invariably at the top of a tree varying from about 80 feet in height to as low as 15 feet; I have already made various references to site, construction and size, as well as to the use of the same nest year after year. Davison refers to a nest used annually in the Wankie Game Reserve, and in which the birds begin to show interest in the middle of January. Another nest in the same Game Reserve which has been used for three years is described as "a flat platform of sticks lined with grass" and the eggs "glossy white, with a blue tinge, slightly pitted"; after it had been vacated by the Saddle-bills one year, it was used by a pair of Secretary Birds.

According to Praed and Grant (1952) "may possibly nest on cliffs", and again Praed and Grant (1962) "occasionally on cliffs"; also Clancey

(1964) "sometimes on the ledge of a cliff" (this is based on the two preceding); but I have been unable to obtain any evidence to support cliff breeding.

Nest dimensions I have been given vary from 9 feet by 6 feet, an immensely massive structure or about 5 feet diameter and 18 to 24 inches thick or somewhat oblong and 4–5 feet by 3 feet to about 3½ feet or 3 feet in diameter.

Nests are usually constructed of large sticks, and lined with smaller ones, some grass and occasionally a few feathers (these possibly off the parents); a nest "made entirely of grass" was "almost flat" and "at the top of a 15 foot high tree, *Albizzia harveyi* laced with a thorny vine, on an ant-hill on a grassy plain".

Low-sited nests seem to be not infrequent as there are also records of one at the top of a low thorn tree and another on top of a *Capparis* covered *Diospyros mespiliformis* 15 feet high; Peter Steyn's record of a nest "on a pillar-like growth of thick creepers" also refers to a low site.

Nest sites vary considerably as instanced by one 60–70 feet up in a flooded baobab at Kariba lake (as a rule nests are not in trees standing in water); another at the top of a straight-boled tree (*Manilkara mochisa*) about 50 feet high and two others at 50 feet; two at 40 feet—one on the crown of a large lone tree well out in a vlei, the other on top of a large Acacia in open mixed woodland; one in the old nest of an eagle, *Aquila wahlbergi* Sundevall at 30 feet on an *Acacia giraffae*; two on baobabs—one at 22 feet above the flood water of Kariba; another 30 feet up in the crown of an isolated *Kigelia pinnata* on an ant-hill in the centre of a *dambo* (or vlei)—the nearest tree was a quarter of a mile distant at the edge of *Brachystegia* woodland; another on top of a large tree in an extensive pan with water, but the tree not in the water; and one which was inaccessible at the top of an *Euphorbia ingens.* A tall bird like the Saddle-bill, and its young, require plenty of vertical space—such as one finds on top of a tree—to enable them to stand on the nest.

EGG MEASUREMENTS. The measurements of the twelve eggs which have passed through my hands vary from 79.0–86.3 x 55.3–62.0 mm.; their average is approximately 82.5 x 58.5 mm.

BEHAVIOUR. According to Turner, the adult birds—although not shy on the ground—when on the nest are extremely nervous and sensitive to disturbance, as is occasioned by the noise of a car, which resulted in their not showing themselves at all. It is probable that frequent overlooking and the photographing of the nest by the Kazinga Channel, in Uganda, were responsible for the parents' desertion of eggs on the point of hatching—an unusual happening at such an advanced stage of incubation. But it tends to bear out Turner's claim of the extreme nervousness of this species when on the nest. According to Bannerman (1957) the Black Stork, *Ciconia nigra* (Linn.) too is very easily inclined to desert.

Several reliable observations indicate how tight a brooding bird will sit, but on the other hand there are equally reliable records which suggest that a brooding bird may not always be so careful in diverting attention from a nest.

Turner has never heard the Saddle-bill make any noise or call and there is no mention of any call by adults or young in the unpublished records I have seen.

In the Southern Sudan, when the c/3 fresh eggs were being plundered, the two parents demonstrated vigorously against the intruder.

C. J. P. Ionides (*in litt.*) tells me he once watched a Saddle-bill on the seashore, in Tanganyika, "herding fish into the shallows, using wide open wings to drive them into shallow water and then catching them".

FOOD. In the numerous unpublished records which I have been permitted to study there are no references to the type of food taken to the nestlings or the frequency of feeding. According to Bannerman (1957) quoting Bouet, in the case of the White Stork the young when five days old are fed every hour and when fifteen days old every two hours; similar observations on the feeding frequency of the Saddle-bill are needed. Juveniles clap their bills on the arrival of a parent with food.

BREEDING SEASONS. The known or presumed breeding seasons (eggs or nestling) of *Ephippiorhynchus senegalensis* are:—

WEST AFRICA	January (and presumably next two or three months).
CONGO	No data.
SOUTHERN SUDAN	September to April.
NORTHERN UGANDA (NILE REGION)	November (or October) to February (or March).
WESTERN UGANDA (near LAKE EDWARD)	May–June–July.
KENYA (AMBOSELI)	Probably May–July.
TANGANYIKA—now TANZANIA (WESTERN SERENGETI)	Perhaps April–May–June.
NYASALAND—now MALAWI, and adjacent MOÇAMBIQUE	Perhaps January; also, according to Praed and Grant (1952) "probably August."
NORTHERN RHODESIA—now ZAMBIA	April to August; November and December.
SOUTHERN RHODESIA—now RHODESIA	February–July.
SOUTH AFRICA (NORTHERN TRANSVAAL)	February–July.
ANGOLA	No data.

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SUMMARY

1. The unreliability of some of the original Saddle-bill egg data, faithfully copied for many years, is indicated.
2. Published for the first time are many nesting and brood records from the Southern Sudan, Uganda, Tanganyika, Northern Rhodesia, Southern Rhodesia, South Africa and Nyasaland.
3. An outline is given of the breeding season in various parts of Africa.
4. The eggs are described and there is reference to clutch size and survival rate.
5. The incubation and nestling periods are discussed, as well as growth stages after leaving the nest.
6. There are details of nest size, construction and site.
7. There is a brief reference to behaviour.

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CONTRIBUTORS

Contributions are not restricted to members of the B.O.C. and should be addressed to the Editor, Mr. John Yealland, The Zoological Society of London, Regent's Park, London, N.W.1. These should be concise and typed on one side of the paper, double-spaced, with a good margin. The first time a species is mentioned, the scientific generic and specific names should be included. Subsequently the same name need only have the initial letter of the genus. Scientific names are printed in italics and should be underlined in the typescript. References should be given at the end of the paper.

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DINNERS AND MEETINGS FOR 1965

20th April (A.G.M.), 18th May, 21st September, 19th October, 16th November and 21st December.

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BULLETIN
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The six hundred and twenty-fifth meeting of the Club was held at the Rembrandt Hotel, London, on the 20th April, 1965.

Chairman: Major-General C. B. Wainwright

Members present 20; Guests 7.

Mr. Philip Wayre showed his film entitled "Wind in the Reeds" which depicts fauna and flora of the Norfolk Broads.

A constant mutant Wood Pigeon *Columba palumbus* L.

by J. S. Ash

Received 14th January, 1965

Through the courtesy of Mr. C. L. Coles I have recently been able to examine the body of a Wood Pigeon shot by Mr. E. B. Marriage near Christchurch, Hants, on 22nd December 1964. This bird showed such an unusual pattern of aberrant plumage coloration, apparently similar to that of a bird observed by the writer in the field at Damerham, Hants, in 1956 and 1958, that it seems worthwhile putting both occurrences on record.

1. Dead bird (female), 22nd December 1964: whole of top of head grey-blue, slightly paler than normal, some feathers above eye and on forehead with pale buff tips; throat, cheeks and ear-coverts paler, tinged buffish-pink; extensive white neck patch extending and meeting at back, each feather being pale grey at its base and having a median transverse deep pinkish-buff bar and broad dirty white tip; only a suggestion of metallic green on tips of some neck feathers at base of white neck patch.

Upper back deep pinkish- (mauvish- at some angles) buff, becoming more buff on middle back; mid-back to upper tail-coverts, pale greyish-blue; outer upper tail-coverts speckled and deeply fringed pale buff; breast as upper back; rest of under parts normal except under tail-coverts which were finely speckled pale buff. Rectrices dark grey; primaries dark grey with white leading edges and deep buff tips on 5th–9th; secondaries grey, speckled buff; tertials similar but more speckled buff; primary coverts and bastard wing blackish-brown with broad deep buff tips; the outer greater coverts and adjoining lesser coverts (the white "flash" on a normal bird) were pale grey finely speckled with buff; inner greater coverts grey, speckled and broadly tipped with buff; lesser coverts and scapulars pale grey, broadly fringed deep pinkish-buff. One replaced primary and two replaced secondaries were of normal colour.

Tarsi deep red; claws pale horn with dark grey bases and dark upper central streak on some. The bill was finer than type from the nares to tip, deep vinous-red shading to grey at tip and resembling that of a Turtle Dove *Streptopelia turtur* in colour and general shape, though not in size. The flesh round the eye was deep red giving the bird the appearance of an orbital ring, again reminiscent of *S. turtur*.

Measurements: weight 468.6 gms.; wing 238 mm.; tail 149 mm., tarsus 33.5 mm.; bill 27 mm. from base of skull to tip, 21.5 mm. from base of feathers to tip (*palumbus* averages 22 mm.), width at base 10 mm., width at nares 6.5 mm. Wing formula: 4th primary longest; 3rd 7 mm. shorter; 2nd 12 mm. shorter; 5th and 6th 24 mm. and 42 mm. shorter. On the right side, the 4th rectrice extended for *ca.* 25 mm. beyond the other and was *ca.* 10 mm. wider at its widest point than its corresponding member on the left side.

2. Live bird, 5th and 7th March, 1956: watched feeding during afternoon in grass field with other normal birds with which it was compared: rump and head slightly paler blue grey; neck patch white and twice as extensive, probably extending as narrow band round back of neck; rest of upper parts and wing-coverts delicate pinkish-brown; breast, slightly darker than former; no sign of white "flash" in flight or at rest; when flying wing showed a dark and light contrast as in a Stock Dove (*Columba oenas*). When disturbed it always flew off alone and did not join the circling flock of normal birds, although it joined them when feeding. What was presumed to be the same bird was again seen in the same field on 5th March 1958; on this occasion the wing "flash" was noted as being discernable as a faintly greyish area.

This mutant is of interest for several reasons. Firstly, it is apparently a constant mutant in so far as two apparently similar individuals were involved, and secondly the changes in colour of the plumage are complex. Based on the descriptions given by Harrison (1963) there appears to be some dilution (or chlorochroism) of a non-eumelanic nature of the normal grey plumage, but whether this is true dilution as defined by Rensch (1925) or due to schizochroism, which results in the loss of a pigment, cannot be ascertained. The appearance of pinkish and buff shades may be due to either of the above causes or to a degree of erythrism. A surprising feature is the increase in the extent of the white neck patches and the loss of the white wing flashes. A final explanation of this interesting aberration will depend on a better understanding of the pigment structure of the Wood Pigeon and the genetical factors governing it.

References:
Harrison, C. J. O. (1963): Grey and fawn variant plumages. *Bird Study*, 10: 219–233.
Rensch, B. (1925): Die forberaberration der Vogel. *Journ. f. Orn.*, 73: 514–539.

Comments on the mutant Wood Pigeon *Columba palumbus*

by R. K. Murton

I now have in my possession the aberrant Wood Pigeon shot near Christchurch, Hants, on 22nd December 1964 which was described above by Dr. J. S. Ash. I should like to comment on its partial resemblance to certain of the Canary Islands "Wood Pigeons", a resemblance which impressed me as soon as I received the skin. The specimen is interesting firstly because the plumage changes are complex and apparently constant as Ash points out and for this reason it may give some insight into the evolution of the island species.

It should be pointed out that those *Columba* pigeons inhabitating the Canary Islands are descendants from successive influxes of mainland *Columba* stock or *palumbus* species which became sufficiently speciated not to interbreed with later arrivals from the mainland. In order of evolutionary emergence there exist *Columba junoniae* Hartert 1916, *C, trocaz* Heinekin 1829, *C. trocaz bollii* Godman 1872 (*C. bollii*, as some consider this a good species) and *C. palumbus maderensis* the latest arrival, which differs little from the type. Full descriptions of these island species can be found in the original accounts but for some general comparisons see Goodwin (1959a).

It is sufficient to point out that *C. junoniae* has lost the white neck and wing marks, the back and wings have darkened to a deep immaculate chocolate, while the *palumbus* type neck iridescence has been extended to form a complete neck band. *C. trocaz* is much darker than *palumbus* and has deeper coloured vinous under parts, the colour being more extensive than in *palumbus*. The white wing marks have been lost while the neck mark has become more extensive to form a complete area of white over the top of the neck. The iridescent neck colours seem to have suffused into the white resulting in grey-green undertones. *C. bollii* resembles *trocaz* but is smaller, has a finer bill and has also lost the white neck mark, while the iridescent neck plumage has become more extensive.

It is interesting that the mutant has suddenly lost the white wing marks, in which it resembles all the Canary Islands species; acquired a larger but duller neck mark, in which it resembles *trocaz;* and become redder and greyer than normal—which in general is a feature of the island forms. I was also struck by the bill, which appeared finer at the tip than is normal in *palumbus*. The appearance of this aberrant individual suggests that a similar mutant could have arisen in early influx(es) of birds reaching the Canary Islands and be selected for under the protection of geographical isolation. This is of course speculative, but the important point is that this mutant is to a large extent intermediate between the mainland and island pigeons and it suggests that the evolutionary processes involved could have progressed rather suddenly by a mutation bringing about seemingly drastic changes. It is also important to note that the loss of signal marks in this case clearly indicates a secondary character and not a primitive one as far as the island species are concerned.

Finally, in discussing some aberrantly coloured wild pigeons in the National Collection, Goodwin (1959b) mentions eight variants, three of which are redder than normal and another two which are very much redder with a change in colour pattern.

References:
Goodwin, D. 1959a Taxonomy of the genus *Columba Bull. Brit. Mus.* (*Nat. Hist.*) *Zool.* 6: 1–23.
— 1959b Some colour varieties of wild pigeons *Bull. B.O.C.* 79: 3–9

The Horned Coot, *Fulica cornuta* Bonaparte

by A. W. Johnson

Received 24th November, 1964

The so-called "Horned" Coot is a very rare bird which is found only in a restricted area of high Andean plateau country on the borders of northern Chile, western Bolivia and north-western Argentina and is rarely if ever met with below 10,000 feet. The precise limits of its range in Argentina and Bolivia are still unknown, but in Chile it occurs from lake Caritaya, at 12,000 feet in Lat. 19° S. to lake Valeriano and El Cajon del Encierre in Lat. 28° 46′ S. at the head waters of the Huasco river, Atacama. From Lat. 18° S. up to and beyond the Peruvian border it is replaced by the closely allied, similar-sized Giant Coot, *Fulica gigantea*.

Except for a few collectors' specimens, virtually nothing was known about this remarkable coot until, in January 1936, W. R. Millie came across a pair with four young birds at Laguna Grande at 10,000 feet in the Andes of Atacama. Visiting this region again in November of 1945 he found a pair still in residence at Laguna Grande and, on a smaller lake higher up, a second pair occupying a large nest with two eggs about 30 yards from the shore. Investigating further in January of the following year, Millie found a second nest, this time with five eggs, on another small lake 2,000 feet higher up, and further up still at 14,000 feet in completely arid country a series of nests of a most original type.

Approaching these in a boat, Millie found that these bulky waterweed nests were not floating or anchored beneath the surface as he had supposed, but were placed on top of conical mounds of stones built up from the bottom of the lake to a height of about two feet and with an area at the top of approximately 10 square feet.

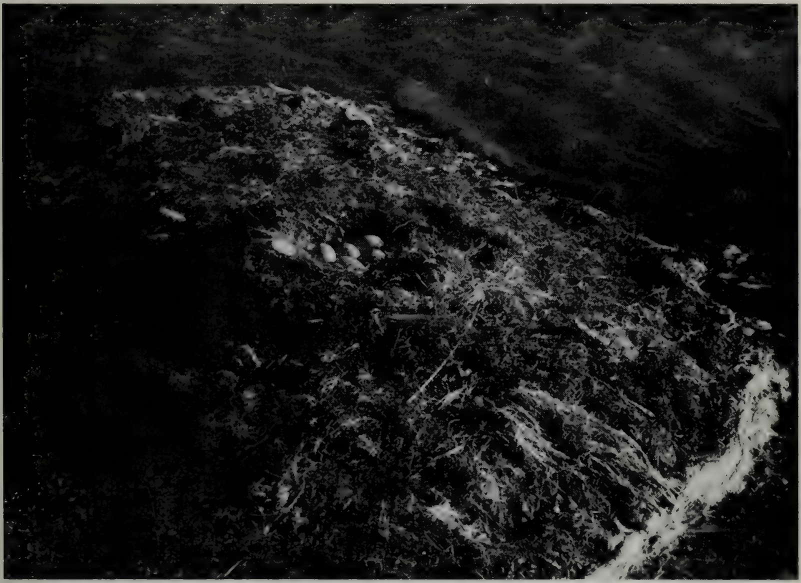
Determined to follow up this discovery, Millie returned to this lake at the beginning of the following nesting season and was able to actually watch the process of nest building. The stones for the cone foundations were picked up one by one from the lake shore or from the bottom in shallow water and carried in the bill to the building site with both members of a pair taking part in this arduous task.

In view of the interest aroused by this discovery and anxious to obtain further information about the curious "horn" or "proboscis" of this coot and at the same time follow up re-discovery of James's Flamingo of the year before, in 1958 Millie and Behn made a similar survey of the high altitude or "puna" zone immediately to the south of the region traversed by us.

Although Andean and Chilean Flamingos were found in the lagoons and salt lakes at altitudes of between 12,000 and 14,000 feet, there were no signs of either James's Flamingo or the Horned Coot. However, on a small lake of relatively fresh water situated at the southern tip of the very extensive Maricunga salt-lake (Lat. 27° 4′ S: Long. 69° 10′ W.) a large breeding colony of at least 100 of the coots was located, by far the largest concentration of this species ever recorded.

This lake, known as Santa Rosa, is about a square km. in extent and, being fed by a number of thermal springs of only slightly saline water, permits the growth of a limited amount of water-weed, mostly *Ruppia filifolia*, which is entirely absent from the lagoons of high salt content frequented by the flamingos.

On this lake were about 30 nests in all stages of construction, repair or decay (as compared with 36 floating platforms of the Giant Coot, *Fulica gigantea*, found by the author years ago on lake Cota-Cotani in Lat. 18° S., alt. 15,800 feet). Some of these nests were still in use; others had obviously only just been left by the young and others were partially destroyed, while yet others had been renovated or made use of by other birds such as the Andean Crested Duck (*Lophonetta specularoides alticola*), the Crested Grebe (*Podiceps occipitalis juninensis*) and the Andean Gull (*Larus serranus*).



The nest with its five eggs.

All the nests were built on a cone-shaped foundation of stones, varying from 30″ to 36″ in height, and coming very close to the surface without ever actually protruding above it. The cones of the nests in use or recently abandoned were round in shape with a diameter of approximately 13 feet; a random sample of the stones used for building up these cones gave weights of up to 1 lb.

On top of the stone foundations the birds had placed a quantity of soft vegetable matter (*Ruppia filifolia*) arranging it in the shape of a truncated cone to a height of from 14″ to 24″ and a diameter of about 6′ 6″ at the base and narrowing to between 18″ x 24″ at the top, measuring across the actual nest cavity. While the material of the inner walls was in a state of decomposition, it was obvious that the centre walls were continually being renovated by the addition of fresh material which the birds pulled up from below the surface and, in full view, dragged to the nests, for the most part in the bill but sometimes with the entire head and using the curious appendage or "muscular proboscis" which is peculiar to this coot. During this dragging process part of the material is carried on the back and the rest floats on the water on either side of the body. On reaching the nest the seed-pods are torn off and given to the young for food and the rest of the material used for maintaining the nest in good condition.

At Santa Rosa, due to the late date (January), it was not possible to observe the actual construction of the stone foundations, which would appear to be a unique feature of this coot. No doubt these cones, once built, are used year after year and repaired from time to time. Probably what Millie witnessed at El Cajon del Encierre was this process of repairing existing cones, but even so it is to be presumed that some other method of transportation must also be used, as it would seem hardly possible that the birds could carry stones of a size corresponding to a pound in weight in such a manner.

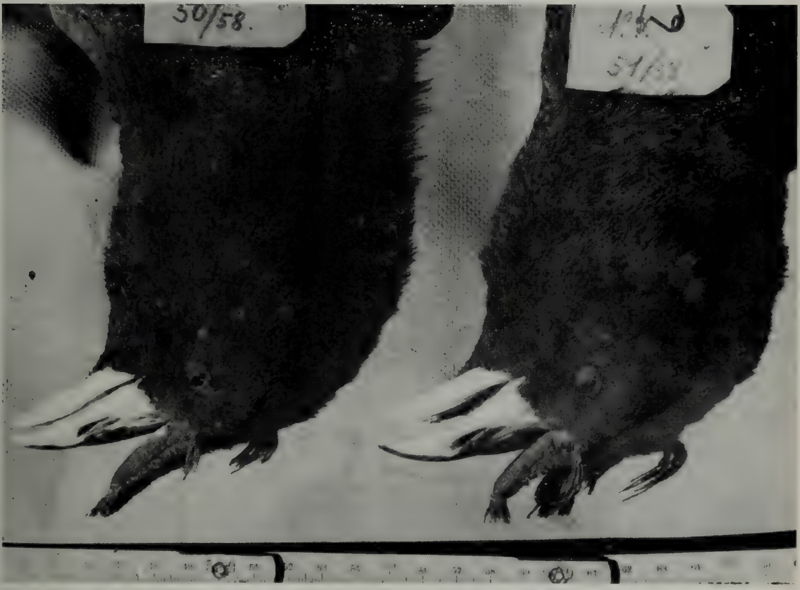
As far as we are aware, there is no other bird that builds its nest in this peculiar and original fashion but it is also necessary to add that we now know that it must not be regarded as the invariable pattern of the species, as three nests found by us at lake Caritaya, Andes of Arica (See Supplement *Las Aves de Chile* p. 399) where a fair amount of vegetation is available, showed no signs of these stone foundations but were built in shallow water on top of small natural hillocks or "blisters" on the muddy bottom.

As regards the coots themselves, the adults are uniformly blackish in both sexes, somewhat darker on the head and merging into slate colour on the ventral surface. The plumage of the immature is in general lighter in colour, lacks the black on the head and shows a large white area on the chin and throat. The bill is stout, yellow with a suggestion of orange, and a conspicuous black spot on the culmen in the adult, and in the immature greenish-black with a slight brownish tint. In both adult and immature

A pair of *Fulica cornuta* with two young. Santa Rosa lake, January, 1958.

the legs and feet are greenish-brown with dark grey areas at the joints. The toes, provided with strong claws, are very large with the middle toe attaining a length of from 9 cm. to 13 cm., it being noteworthy that in the specimens collected for examination of the "horn" or proboscis the feet of the males are considerably larger than those of the females. In the nestling the feet are black, the bill pink with black and yellow at the tip, and the entire body, with the exception of a very small whitish area on the chin, covered with fine, jet-black down. The iris in the nestling and in young immature birds is brown, but as the bird grows this colour gradually gives place to the orange-brown characteristic of the adult.

The appendage on the head in the area where most coots have a horny frontal shield is present in both sexes and has been incorrectly referred to in the nomenclature of the bird as a horn "*cornuta*". In a study made in 1957 by Dillon Ripley, the statement is made that it is "perhaps somewhat extensible or erectile", and histological sections prepared by Dr. Behn demonstrate convincingly that it is a purely muscular organ and as such not only extensible but also actively erectile, and should be described as a miniature trunk or proboscis.

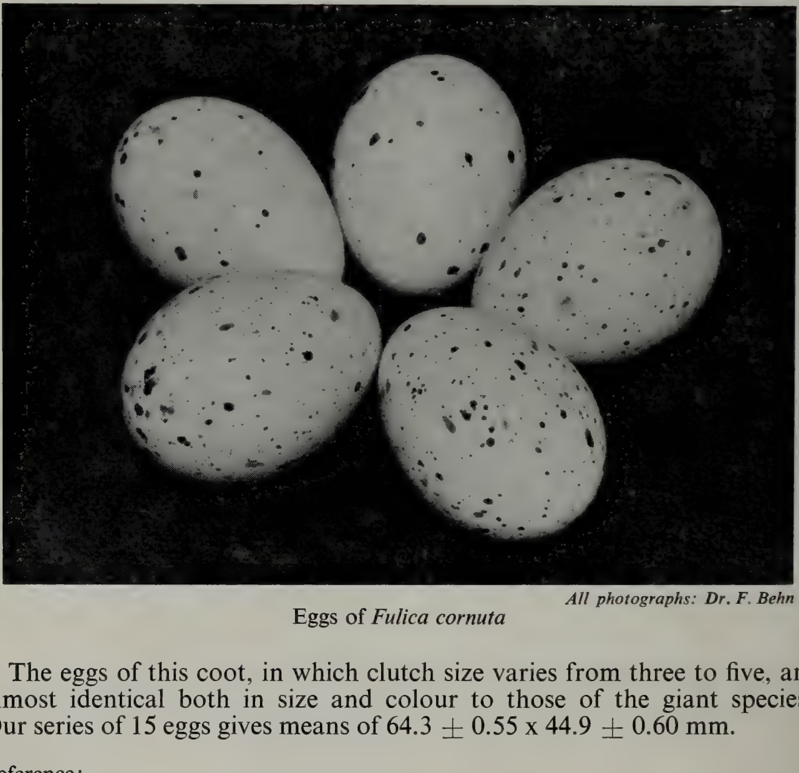


Heads of *Fulica cornuta*, showing the strange muscular organ, incorrectly termed "horn".

What can be the purpose of this curious organ? As already pointed out, there is first-hand evidence that it is sometimes used to assist in the transportation through the water of the vegetable material required for the top structure of the nest and for feeding the young, but if that is its real "raison d'être", how can we explain that the Giant Coot, which lacks this organ, also drags material to the nest in exactly the same manner, the only difference being that in this latter species the nest is a large floating platform, usually in deep water, but anchored to the aquatic vegetation growing below the surface. It will probably be better to say that we do not know the purpose of the Horned Coots' peculiar muscular appendage and leave it at that.

Apart from our observations relating to reproduction, very little is known regarding the habits and life cycles of either the Horned or the Giant Coots. We can say, however, that notwithstanding their reluctance to take flight during the day, preferring like all coots to skim along the surface with dangling or treading feet, there is no doubt that both species are strong fliers and accustomed to migrate from one feeding ground to another, preferably it would appear, at night.

In the case of *F. cornuta* Millie was able to verify personally statements made to him to this effect by the local Aymará inhabitants (and to the writer in the case of the Giant Coots at lake Cota-Cotani), as in April of 1956 while camped on the shores of the aforementioned Laguna Grande a flock of about 50 of these coots arrived after dusk, spent the night and the following day at the lake, and during the following night disappeared completely.



All photographs: Dr. F. Behn

Eggs of *Fulica cornuta*

The eggs of this coot, in which clutch size varies from three to five, are almost identical both in size and colour to those of the giant species. Our series of 15 eggs gives means of 64.3 ± 0.55 x 44.9 ± 0.60 mm.

Reference:
Johnson, A. W., Behn, F. and Millie, W. R. (1958) The South American Flamingos. *The Condor* 60: 289–299.

Unusual epidermal condition in a Golden Pheasant

by M. B. Jones

Received 23rd January, 1965

On 29th January, 1964, I received from the Cotswold Game Farm, Stroud, Gloucestershire, a female Golden Pheasant (*Chrysolophus pictus*) on which most of the skin of the ventral surface was crenated in a curious manner (see photo). The bird was in rather poor condition (410 gms.) with general appearance of having shrunk within its own skin owing to the loose folds formed by the many ridged yellowish crenations. On closer examination these ridges were seen to be the result of proliferations of the epidermis and extended from the lower throat, over the breast, belly and flanks to the vent, and over the ventral surface of each thigh. The affected areas were devoid of all feathers except the filoplumes. The rest of the skin was normally feathered.

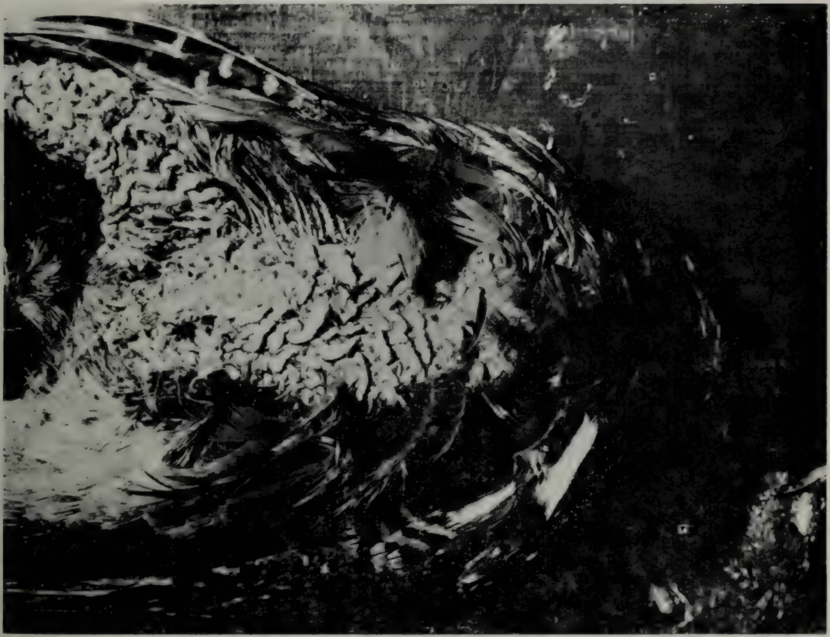


Photo: G. I. Sharpe

Unusual epidermal condition in a Golden Pheasant.

Apart from its fairly thin state the bird showed no evidence of any other concurrent disease. There was no evidence of mites externally. The specimen was passed to the Central Veterinary Laboratory of the Ministry of Agriculture, Fisheries and Food, at Weybridge, Surrey. The condition was unknown to them, and their main findings were as follows (E. Boughton pers. comm.)

"The condition did not resemble exudative diathesis (Creech, *et al.*, 1958) or skin leucosis either grossly or histologically. The distribution of lesions would tend to rule out a photosensitisation, and the lesions did not appear to resemble epidermal staphylococcosis as described by Jungherr and Plastridge (1941).

Sections of the skin showed subcutaneous inflammation, with infiltration by polymorphs and lymphocytes and a little oedema. The layer of keratinised cells was thicker than normal, and Gram-stained sections showed Gram-positive cocci (apparently short-chain Streptoccoci) in the loose outer layers. One or two yeast-like bodies were also seen, but sections stained by Grocott's method did not reveal fungal hyphae.

Bacterial cultures yielded heavy growths of anthracoids, Staphylococcus albus (coagulase negative, non-haemolytic) and Streptococcus viridans. Both the cocci could give rise to subcutaneous inflammation, but would probably not get a hold on healthy skin. Virus isolation was not attempted, there being no analogy and no indication of a possible type of virus''.

The nearest approach to a similar condition to be found in the literature seems to be Xanthomatosis as described by Peckham (1955).

I am much indebted to Captain P. R. Symonds for the specimen, Dr. G. I. Sharpe for the photograph and to the staff of the Poultry Department of the Central Veterinary Laboratory for the results of their examinations, and particularly to Mr. E. Boughton for his helpful comments.

References:
Creech, B. G., Rahman, M. M., Reid, B. L., and Couch, J. R. 1958. Exudative diathesis in chicks. *J. Nut.* 64 (1), p. 55.
Jungherr, E. and Plastridge, W. N., (1941). Avian staphylococcosis. *J.A.V.M.A.* 98. p. 27.
Peckham, M. C., (1955). Xanthomatosis in chickens. *Am. J. Vet. Res.* XVI (61). p. 581.

On a variety of Swallow

by James M. Harrison

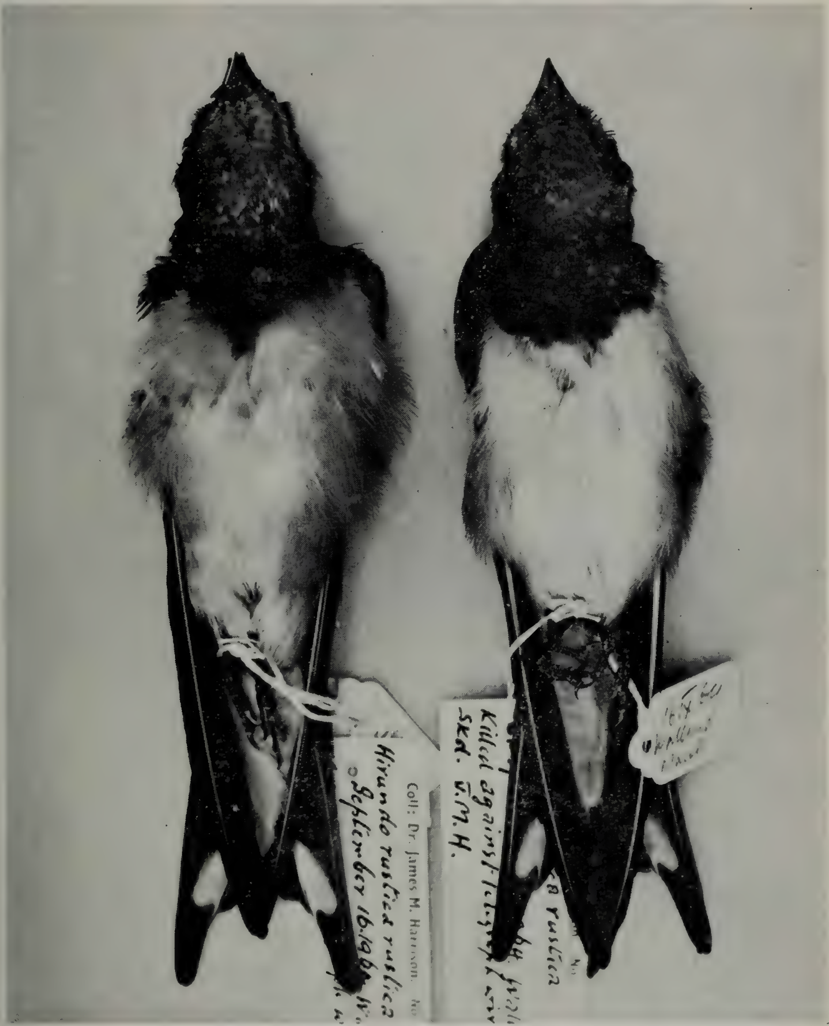
Received 25th February, 1965

On 16th September, 1964 in a strong south-westerly wind with heavy showers of rain, two immature Swallows, *Hirundo rustica rustica* Linnaeus, both females, were found dead under the telegraph wires in the Walland Marsh, Kent.

One of these, as can be seen from the plate, is of the creamy-breasted type, the next commonest colour phase (*fide* Vaurie, 1951.) to the pinkish-breasted bird in the British Isles. The other is of a warm buffy-brown on the under parts. Vaurie (*loc. cit.*) describes the colour of the British birds as pinkish, and in so far as the western mainland populations are concerned states that in the British Isles 13 were pinkish, 4 creamy and only 5 were whitish; in Sweden 1 was creamy and 6 white, while in north-western continental Europe 6 were pinkish, but less so than in the British Isles, 3 were creamy, 2 white, 1 as red as, or redder than *transitiva* from Palestine. Although the number of specimens quoted is not large, the findings suggest that the variation described is clinal in nature, and that the suffusion of the under parts from reddish, through pinkish to white runs on a south-east to north-west line.

This particular buffy-brown specimen, which is the subject of this note, is however, exceptional in that it shows symmetrical spotting on the breast though it does not show any suggestion of a nuchal band.

Of the common Eurasian swallows the species which shows striation of the under parts to the greatest extent is, of course, the Red-rumped Swallow, *Hirundo daurica* L.


Coll: Dr. James M. Harrison.
Hirundo rustica rustica
September 16.196
Killed against
Skd. J.M.H.

IMMATURE SWALLOWS.

Variety on the left. Normal on the right:

It is well known that sexual dimorphism in the Hirundinidae is very slight, and generally in many species of birds spotting and striation are most often to be found in females and immatures, and such markings may well be regarded as primitive.

Under these circumstances one may postulate that such characters found in the adults of a species could point to one in which an arrest in evolution had occurred. Another pointer in the same direction is provided by those species in which there is feeble, or even absent sexual dimorphism. A strong differentiation of the sexes must have come about from selection pressures, except of course where it has arisen as a result of adaptation serving a functional use as in the case of the difference of bill structure in the Huia, *Hetaralocha acutirostris*. Absence of marked sexual dimorphism is advanced as evidence of a lack of competition in mating, a fact which certainly applies to the Hirundinidae.

In their review of the generic classification of the Swallows, Mayr and Bond (1943), pass some general comments upon the relative characters to which importance can be attached in establishing a classification.

The value of colour patterns is stressed, indeed it is stated that "colour patterns are of considerable help in classification, because they are frequently more conservative in phylogenies than are structural features". The latter are often the result of adaptation and are therefore not to be relied upon as classificatory aids. In considering the pyhlogeny of the Hirundinidae they state that *Phedina*, the Madagascar species, may possibly be related to *Hirundo*, they also state that this species is the "least specialised Swallow"; from this it follows that it is therefore probably also the most primitive member of the family.

It does not resemble *Hirundo* very closely superficially; the under parts are however streaked and the tail is squarish and unspotted.

A further phylogenetic link with the Old World Hirundinidae is provided by *Petrochelidon andecola* (D'Orbigny and Lafresnaye), of the Andes of Peru and Bolivia, in which in the immatures the rump and upper tail-coverts are rufous.

Vaurie (1951 *loc. cit.*) states that all forms of *daurica* are streaked underneath in variable degree, with the nominate race as poorly striated. In *H. striolata* the streaking of the under parts is similarly rather variable, though by and large heavier than in the *H. daurica* forms. Of the *striolata* group, the race *stanfordi* is the heaviest marked.

If it is conceded then that spots and striations are basically equivalent when phylogenetic assessments are made, then in this case it is evident that such characters found occurring in any of the normally non-striated Hirundinidae, must be derived from genes carried in the southern members of the complex. Furthermore it is also probable that the buffish, or pinkish tone of the under parts may be a linked character also derived from such southern and south-eastern elements.

It would seem therefore that the above instance in *Hirundo rustica rustica* provides another example in which colour and pattern forms a pointer in the phylogeny in this group of species.

Acknowledgements

I would express my grateful appreciation to Dr. Jeffery Harrison for the two specimens and for general comments, and to Dr. Pamela Harrison for the photograph of the birds.

References:

Vaurie, C., (1951) Notes on some Asiatic Swallows. *Amer. Mus. Novit.* No. 1529.

Mayr, E. and Bond, J., (1943). Notes on the Generic classification of the Swallows, Hirundinidae. *Ibis.* 85, pp. 314–334.

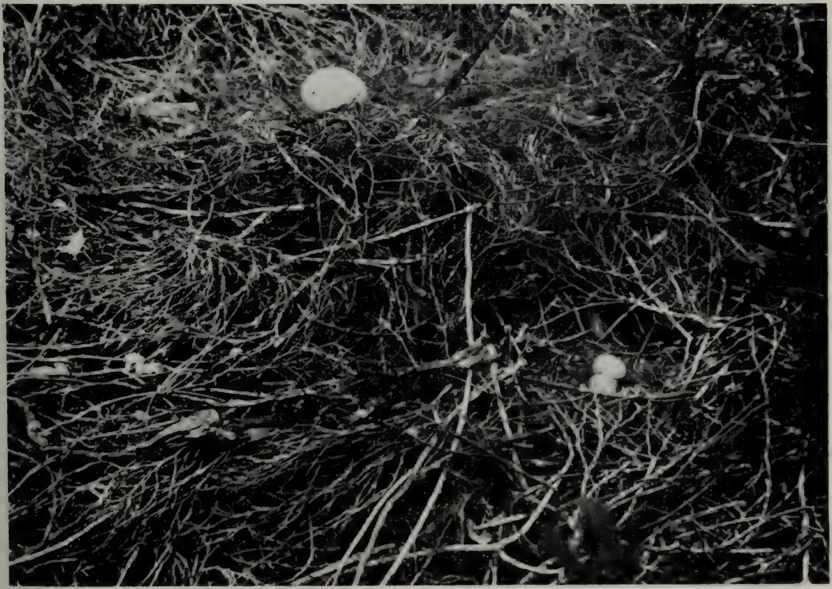
A communal nest of Lappet-faced Vulture *Torgos tracheliotus* (Forster) and East African Greater Kestrel, *Falco rupicoloides arthuri* (Gurney)

by CHARLES R. S. PITMAN

Received 17th February, 1965

Myles Turner, a Park Warden in the Serengeti National Park, in Tanzania, has sent me the details of an interesting occurrence of communal nesting by a Lappet-faced Vulture and an East African Greater Kestrel in the neighbourhood of Seronera, in the Western Serengeti region.

The vulture's nest was found on 9th May 1964 at the top of a 15 feet high *Pappea capensis* Eck and Zey in full leaf growing amongst the rocks of a small isolated inselberg on an open plain. The shade of this tree was selected as a suitable place for the Director of the Tanzania National Parks (John Owen), who was on tour, and Turner to have lunch. Their attention was attracted to the nest when a pair of kestrels flew away from it. They hovered nearby and then flew off about 200 yards and perched on a rock. Turner climbed up to the nest to investigate and was unaware of the brooding vulture until he actually peered over the rim of the nest and the huge bird took off at very close range and its identity was unmistakable.



Turner was astonished to find a vulture's egg in a slight depression in the nest and only 2 feet 4 inches distant in another depression four kestrel eggs. As the short space between the two lots of eggs was quite flat the vulture and the kestrel when brooding must have been visible to each other—an interesting association. About five minutes after flying away the vulture returned and flew very slowly and low over the nest and then disappeared not to return. The vulture's egg and two of the kestrel eggs —all were fresh—were collected and sent to the British Museum (Natural History).

The nest, a massive structure of sticks and coarse twigs and without lining, was carefully measured—its dimensions being 6′ by 6′ and 2′ thick. The leg bones of Thomson's Gazelle and some hair were in the nest, as well as some odd gazelle bones. The tree had been recently used by a Leopard for storing its Thomson's Gazelle kill; the carcase had been hanging just below the nest—another curious association.

At the time of the discovery of the nest the countryside was rapidly drying up after the long rains.

Fifty days later, on 29th June, the nest was revisited; the vulture had not laid again but a kestrel was sitting on the two eggs which had been previously left and it was concluded they must have been infertile.

Turner's photographs show the nest tree and its surroundings, and the eggs *in situ* (unfortunately two of the kestrel eggs had been removed prior to the photography).

I am greatly indebted to Myles Turner for this valuable account, to the Trustees and the Director of the Tanzania National Parks for permission for its publication, to Dr. P. J. Greenway of the East Africa Herbarium, Nairobi, for the identification of the nest tree, and to C. J. O. Harrison, British Museum (Natural History) for checking the egg measurements.

The vulture's egg measures 91.4 x 64.3 mm. and is a dirty white, almost imperceptibly pitted, with faint, narrow, even smears of light brown all over and concentrations of the same pallid colour on the broad top and at the pointed end. The kestrel eggs are typically coloured and marked with specks and spots or broad smears and smudges of burnt umber or dark rufous brown; two of them measure 40.8 x 31.7 and 41.0 x 31.9 mm. The measurements of four sets, each of four eggs, of this kestrel which I obtained from the Blayney Percival collection and which had been taken on the Athi Plains, in Kenya, range from 38.1–41.5 x 29.9–32.3 mm., and average 39.64 x 31.34 mm. Scarcely two of these sixteen eggs are alike, though all are typically kestrel. The Greater Kestrel normally utilises the old nests of tree-breeding raptors for its own eggs.

There seem to be no published records of a similar combined nest; also I have been unable to obtain any additional information on this interesting subject from local correspondents.

The eggs of the White-throated Greenbul *Phyllastrephus albigularis* (Sharpe)

by C. J. O. Harrison and S. A. Parker

Received 30th January, 1965

According to Mackworth-Praed and Grant (1955) the eggs and nest of the White-throated Greenbul *Phyllastrephus albigularis* are undescribed. In revising part of the collection of the British Museum (Natural History), two clutches of this species were discovered, one of which was taken together with the parent bird. The eggs had tentatively been assigned to this species or to *Pycnonotus layardi*, prior to the identification of the parent bird.

Both clutches were collected by L. M. Seth-Smith at Mpumu, Uganda in 1915. One was taken on 15th March (B. M. no. 1920.6.7.4–5) and given the set-mark 55. The accompanying note states—"2 eggs fresh. Nest a typical Bulbul's *P. layardi* shot close to nest but eggs not like those of *P. layardi*. No other bird seen near nest although I waited for a long time. In forest. Nest of the slung variety which I have seen in *layardi* before but not common." The eggs are long, elliptical oval, with a high gloss. They are a pinkish-beige colour with many fine grey markings towards the larger end giving this a general greyish appearance, and with a concentrated zone of grey markings wreathing the larger end just beyond its broadest part. They measure 24.7 x 15.9 and 23.4 x 15.6 mm.

The second clutch was taken on 25th March (B. M. no. 1920.6.7.12–13) and given the set-mark 56. The accompanying note states—"Slightly incubated. Believed to be the same as no. 55 as eggs are very similar and nest identical. Bird had to be shot at close quarters as nest was in thick forest—kept for identification. Nest 1ft. from ground, 150 yards from (nest) 55, probably same pair." The specimen referred to is in the museum collection (B. M. 1920.6.7.178) and is a female. The eggs are very glossy but more ovate than the previous clutch and a deeper buff in colour, the wreath of darker markings around the larger end of each appearing purplish, while in addition one shows some pale brown scrawlings sparsely distributed around the large end and along one side. They measure 21.3 x 15.2 and 21.7 x 15.4 mm. In view of the difference it seems unlikely that these would be successive clutches of the same pair.

Reference:

Mackworth-Praed, C. W. and Grant, C. H. B. 1955. *African Handbook of Birds*, series 1, Eastern and South Eastern Africa, vol. 2. London.

Some misidentified eggs of the Grey Wood-shrike *Tephrodornis gularis* (Raffles) and the Long-tailed Sibia *Heterophasia picaoides* (Hodgson)

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by C. J. O. HARRISON and S. A. PARKER

Received 27th January, 1965

The following misidentifications of eggs have been recorded in literature and require to be corrected. They appear to have been due to some confusion in the identification of several shrike-like birds with mainly grey and white plumage.

The egg of the Grey Wood-shrike, *Tephrodornis gularis* was first described by Hume (1889) from an oviduct egg collected by Davison, near Tavoy, Tenasserim, on 26th March 1874 (B. M. no. 1892.7.1. 1944). This is a typical *Tephrodornis* egg, broadly ovate, pale green heavily marked with blotches and specks of brown and blue-grey, measuring 21.7 x 16.9 mm. It agrees well with the eggs of other species in this genus.

In the same account Hume referred to a clutch of two eggs collected by Mandelli at Ging, near Darjeeling, on 27th April 1875 (B. M. no. 1892.7.1. 1945–6) which were very like those of a shrike. They are larger than the known *T. gularis* egg, very pale green with fine brown spots mostly concentrated near the larger end, and measure 22.9 x 18.1 and 24.6 x 18.6 mm. Both the eggs and the description of the nest agree with those of the Rufous-backed Shrike *Lanius schach* and are now considered to belong to that species.

Nine eggs taken by H. Low on the Brunei River in North Borneo (B. M. no. 1901.11.30. 279–280; 1962.1.782) were described by Sharpe (1879) and more recently by Smythies (1960) as the eggs of *T. gularis.* They are elliptical ovate and creamy-buff in colour with a heavy band of pale red-brown and purple blotches wreathing the larger end, and sparser fine markings elsewhere. They measure 24.6–25.4 mm. in length and 16.3–17.7 mm. in breadth. They have now been identified as belonging to the White-breasted Wood-swallow *Artamus leucorhynchus.*

A clutch of four eggs collected at Rungbee, near Darjeeling, by J. A. Gammie (B. M. no. 1892. 7.1. 2973–2976) were originally stated to be like those of a shrike but in the absence of comparative material were described by Hume (1889) as those of the Long-tailed Sibia *Heterophasia picaoides*. They are broadly ovate, stone-coloured with fine spots mainly wreathing the large end, and measure 23.2 x 18.4; 23.1 x 18.7 and 23.5 x 17.8 mm. They have been re-identified as eggs of *Lanius schach*. Typical eggs of *H. picaoides* taken in Sikkim and at Darjeeling by H. Stevens are pale blue with fine profuse red-brown speckling and measure 23.4–25.4 mm. in length, and 18–19 mm. in breadth.

References:

Hume, A. O. 1889. *Nests and eggs of Indian Birds*. 2nd. Edn. Ed. E. W. Oates. Vol. 1. London.

Sharpe, R. B. 1879. Contributions to the ornithology of Borneo. *Ibis* Ser. 4, Vol. 3: 252.

Smythies, B. E, 1960, *Birds of Borneo*, London,

CONTRIBUTORS

Contributions are not restricted to members of the B.O.C. and should be addressed to the Editor, Mr. John Yealland, The Zoological Society of London, Regent's Park, London, N.W.1. These should be concise and typed on one side of the paper, double-spaced, with a good margin. The first time a species is mentioned, the scientific generic and specific names should be included. Subsequently the same name need only have the initial letter of the genus. Scientific names are printed in italics and should be underlined in the typescript. References should be given at the end of the paper.

Authors introducing a new name or describing a new species or race should indicate this in their title and display the name prominently in the text followed by *nom. nov.*, *sp. nov.*, *subsp. nov.* as appropriate. In these descriptions, the first introduction of the name should be followed by paragraphs for "Description", "Distribution", "Type", "Measurements of Type", "Material examined" and further sub-headings as required.

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DINNERS AND MEETINGS FOR 1965

18th May, 21st September, 19th October, 16th November and 21st December.

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BULLETIN
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The five hundred and twenty-sixth meeting of the Club was held at the Rembrandt Hotel, London, on the 18th May, 1965.

Chairman: Mr. R. S. R. Fitter

Members present 20; Guests 2.

Dr. W. R. P. Bourne has kindly sent the ensuing paper on the subject of the talk given by him at this meeting:

The missing petrels

Introduction

Two populations of petrels are currently thought to be extinct through the depredations of introduced predators at their island breeding stations, the Guadelupe Storm-petrel *Oceanodroma macrodactyla* and the Jamaica Petrel *Pterodroma* (*hasitata*) *caribbaea*. In addition since the war some five forms which had also with varying degrees of confidence been pronounced extinct have been rediscovered, the Short-tailed Albatross *Diomedia albatrus*, the Hawaiian Shearwater and Petrel *Puffinus puffinus newelli* and *Pterodroma phaeopygia sandwichensis*, and the Bermuda and Capped Petrels *Pterodroma* (*h.*) *hasitata* and *P.* (*h.*) *cahow*. Three new discoveries have also been reported, Murphy's Petrel *Pterodroma ultima* in 1949 (*Ornithologie als biologische Wissenschaft* (Festschrift zum 60. Geburtstag von Erwin Stresemann), Heidelberg, p. 89), and two by C. Jouanin, *Bulweria fallax* from the Arabian Sea in 1955, and *Pterodroma baraui* from Réunion in 1964 (*Oiseau* 25: 155; *Bull. Mus. Nat. Hist. Nat.* Paris 35: 593).

The new forms all appear to be rather numerous, and were first collected long before they were recognised as distinct. The Capped Petrel also proves quite common in the inland cliffs of Hispaniola (D. Wingate, *Auk* 81: 147), and judging by observations at sea the Hawaiian Shearwater and Petrel could still be quite common there as well, though not yet reported breeding in strength (F. Richardson and D. H. Woodside, *Condor* 56: 323; F. Richardson, *Auk* 81: 147). On the other hand, the Bermuda Petrel, lost for three centuries on a tiny overcrowded archipelago, was reduced to a handful of aged birds in imminent danger when it was rediscovered, while the Short-tailed Albatross probably only survives at all because immature birds were away at sea when the breeding place on Torishima in the Bonins was devastated first by feather hunters and then by a volcanic eruption (accounts in the *Handbook of North*

American Birds, vol. 1, ed. R. S. Palmer, 1962, New Haven and London). Thus it appears that there are still many things to be discovered about the petrels, and when they are known, urgent action may be required to protect them.

In the course of a survey of the group I have repeatedly been impressed by intriguing gaps in the available information about them, gaps apparently due to inadequate investigation which could soon be filled by intelligent exploration. It may be useful to summarise some of them here in the hope of directing ornithological curiosity in a direction where it is much needed.

1. *The fossil record.*

This has seldom been put first in summaries of directions where investigation is most required in recent times, but this difficult field is one where important information is still very urgently needed. Nothing is known about the history of the Procellariiformes before the appearance of some near-modern types in the middle Tertiary deposits of North America and Europe, although it seems a reasonable deduction from their present distribution that they originated in the southern hemisphere. Fossil penguins have already been discovered in several regions there which add greatly to our understanding of the past history of that group, and fossil petrels are surely to be expected as well. There at least seems a strong case for a most diligent search for them.

Ancient fossil petrels may be hard to find, since the main colonies have probably always been on oceanic islands with a geologically short life, and the older islands may long have vanished under the sea. But there is still much to be learnt about the comparatively recent history of the group, because their distribution must have changed dramatically in even the comparatively recent past with the wild fluctuations in climate in the Pleistocene, while in the last few hundred years the populations of whole archipelagoes have been wiped out by man and introduced predators, notably rats, the mongoose, cats, and hogs. The nature of the natural seabird communities of these islands can only be discovered by a study of their bone deposits, and these are commonly still extremely abundant if searched for in the right way. Examples of what can be discovered by an examination of these deposits are provided by the first revelation of whole extinct petrel communities in the bone deposits of Bermuda, St. Helena, St. Paul and Amsterdam Islands, or the Chatham Islands (R. W. Shufeldt, *Ibis* 1916: 623; W. R. P. Bourne, *Ibis* 99: 94, *Bull. Brit. Orn. Cl.* 76: 126; N. P. Ashmole, *Ibis* 103b: 390; C. Jouanin and P. Paulian, *Proc. XII Int. Orn. Congr*. Helsinki 1958: 368; W. R. P. Bourne, *Notornis* 11: 139).

Thus anyone who chances to visit remote islands can expect to collect information of the very greatest interest and value by a search for ancient bone-beds dating back before the first human occupation. These may or may not be easy to find. In the first place the deposits may have been laid down in the vicinity of the original colonies on offshore islets, coastal or inland cliffs, or exposed slopes, but they may have been removed from these more obvious sites by cultivation and erosion. In consequence, so far the best results appear to have been obtained in caves, followed by wind or water-borne stratified deposits in hollows and gulleys, and then in swamps, though acid water often dissolves at least the smaller bones here. Stratified deposits offer outstanding opportunities for investigation the sequence of colonisation and extinction of different species on an island, of course, if deposits are excavated carefully according to archaeological techniques (always remembering that petrels burrow); yet so far no advanced work of this type appears to have been attempted anywhere. It seems high time surveys of this type were carried out on all oceanic islands. Failing prehistoric material, much may also be learnt from an examination of the middens left by early human colonists.

2. "*Lost*" *species.*

The Cahow was first rediscovered in recent times in Bermuda bone-beds and almost simultaneously through a single stray specimen, and it was then many years before the appearance of others precipitated the systematic search which led to the discovery of the last surviving colony (R. C. Murphy and L. S. Mowbray, *Auk* 68: 266; D. B. Wingate, in Palmer, *loc. cit.*). The same situation in different stages of development is clearly also occuring with a number of other species on different islands elsewhere, and it may be useful to list them as a stimulus to further investigation:—

(1) *The petrels of the St. Helena bone-beds.* Ashmole (*loc. cit.*) lists at least two shearwaters of the genus *Puffinus* and two gadfly petrels of the genus *Pterodroma* which are not known there today from the St. Helena deposits. The remains resembling those of the Wedge-tailed Shearwater *Puffinus pacificus* and the smaller gadfly petrel appear ancient, and may date back to past geological epochs, but those of the smaller shearwater and at least one larger gadfly petrel are abundant and appear quite recent, and it seems likely that they must have survived at least until the period of human colonisation. There are steep coastal cliffs and offshore islets where they may still exist, and if so both of them, and especially the gadfly petrel may belong to endemic forms, or alternatively, judging by its size and the fairly close relationship which appears to exist between the seabirds of the South Atlantic and Indian Ocean, the latter might be one of the two little-known species of Réunion, *Pterodroma aterrima* and *P. baraui.*

(2) The Fiji Petrel *Pterodroma macgillivrayi.* This is a small, heavily built black gadfly petrel still known only from a single fledging male collected at Ngau, Fiji, in October 1855, now in the British Museum (Natural History). It has been referred to the genus *Bulweria* in the past, but its external form is that of a typical *Pterodroma*, with proportions rather like the much larger Tahiti Petrel *Pterodroma rostrata* which nests in the mountains of other central Pacific archipelagoes. Nothing has been heard of it now for over a century, but then nobody seems to have looked for it carefully either; even the members of the Whitney South Sea Expedition were apparently refused permission to explore all islands of the Fiji group. It seems likely it may still exist there; Lt. Cdr. R. O. Morris informs me he has seen various dark petrels at sea there recently, but confusion is likely with the dark phase of the local race of Gould's Petrel *Pterodroma leucoptera brevipes.* At least it seems probable that if one of these species survives in the group, the other may as well.

(3) The Magenta Petrel *Pterodroma magentae.* This also is only known from a single specimen, taken at 39° 38′ S. 125° 58′ W. in the central south Pacific in 1866. I have recently reported (*Notornis* 11: 139) that it agrees in appearance, size and proportions with the Chatham Island Taiko

which bred in the interior of the main island of the Chatham group east of New Zealand well into this century. It seems quite possible that this and several other petrels still only known from the local bone deposits may also still survive undetected somewhere in this scattered and still apparently inadequately explored archipelago, or elsewhere in the subantarctic islands of New Zealand.

(4) Beck's Petrel *Pterodroma* (*rostrata*) *becki*. This is apparently still only known from the two specimens collected by the Whitney South Sea Expedition immediately north of the Solomons in 1929. Subsequent expeditions have failed to find either this or indeed any other petrel in the area at all, though since it resembles the sedentary tropical members of the genus it seems extremely likely to breed nearby. Indeed, Professor A. J. Cain and Dr. Ian Galbraith inform me (personal communications) that nocturnal birds which nest in burrows are reported locally to occur in the higher hills of the Solomons, which are comparatively undisturbed because they are the subject of tabus, and it seems likely that these may include *P. becki* among other petrels. Presumably its debatable status as an exceptionally small race of the Tahiti Petrel *Pterodroma rostrata* or a separate species will only eventually be settled by a comparison of the breeding behaviour, combined with sufficient exploration to show whether the latter, which breeds in the New Hebrides immediately to the south, breeds in the same area as *P. becki* as well.

(5) The Réunion Petrel *Pterodroma aterrima*. The status of this species, long confused with Jouanin's Petrel *Bulweria fallax* among other species, has already been reviewed by Jouanin (*Oiseau*, 25: 155, 27: 12). It is a highly distinct form still only known from four specimens all taken on Réunion before 1890, and it must breed there since two of the specimens (Paris B and Leiden) are immatures with incompletely grown quills. Since numerous other petrels still breed in the mighty cliffs of this formidable island it seems likely that *P. aterrima* does so as well; but I understand from M. Jouanin nobody has managed to find it again as yet. I have already suggested that it is also likely to be one of the petrels occurring in the St. Helena bone-beds as well.

(6) The Jamaica Petrel *Pterodroma caribbaea*. This appears to be a small dark race of the Capped Petrel *Pterodroma hasitata* only recorded from Jamaica, where it is the sole form reported. It is only known from a handful of specimens, of which I have seen nine, three in London, two in Paris, two in Harvard, one in New York and one in Stockholm. One in London is labelled "Hill. ex Gould, July '25", presumably 1825, while six of the others appear to belong to a batch collected by Edward Newton in the Blue Mountains in November 1879 and dispersed around the world, that at New York being labelled "Cinchona Plantation". There appears to be little or no information about the bird since that time, and it is usually assumed to have been wiped out by the introduced mongoose; but if the Capped Petrel can survive in Hispaniola, there seems no reason why this form should not do so in Jamaica; and indeed Captain G. S. Ritchie reports birds are still said to call at night in the Jim Crow mountains in the north-east of the island.

(7) Heinroth's Shearwater *Puffinus heinrothi*. This form is also only known from a handful of specimens from New Britain in the years immediately after the first world war, mainly from Uatom Islet off Rabaul.

In its general appearance and proportions it resembles Audubon's Shearwater *Puffinus lherminieri*, except that the underparts have become suffused with dark pigment leaving only small pale patches on the belly and underwing, while it has a long, slender bill. As with Beck's Petrel in the same area it seems likely that the final determination of its status must depend on further exploration to discover whether Audubon's Shearwater nests in the same area, and whether the two forms differ in their behaviour.

(8) The Guadalupe Storm-petrel *Oceanodroma macrodactyla.* This bird differs from the others because it has been collected freely in the past, but there is now more reason to suppose that it may really be extinct, as it has often been sought in vain since the last records fifty years ago (J. C. Greenway, 1958, *Extinct and vanishing birds of the world.* New York). The main colonies were originally on the middle slopes of an island off the west coast of Mexico which has now been so ravaged by introduced mammals that the vegetation is markedly altered and a whole series of endemic birds destroyed, mainly by cats. If it was really confined to these middle slopes there seems every reason to fear that the cats may have made a clean sweep of the whole colony. However, even here all hope need not necessarily be abandoned, since petrel chicks of uncertain identity have been reported on the island in recent years on offshore islets (T. R. Howell and T. J. Cade, *Condor* 56: 283, 58: 78), and as usual, even if these do not belong to the species in question, if one species survives, another might.

3 *Unexplored islands.*

A consideration of the number of petrels known from only a few ancient specimens whose present status remains obscure, and the larger number of others also only known from a few reports over a large part of their supposed range where it seems likely they are really common, provokes speculation as to what else is being overlooked. The recognised rarities are all local representatives of widespread groups, and five of the specific cases I quoted are gadfly petrels of the genus *Pterodroma* (a group which shows much local variation), one is a shearwater, and one a storm-petrel. If one considers the world distribution of these and some other groups of petrels, such as the prions and diving petrels of the far south, a number of conspicuous gaps in expected distributions become obvious, where according to all the laws of zoogeography the birds might be expected to occur.

Their absence can only be explained easily as the result of extermination or inadequate exploration. Not all these gaps necessarily once held additional species, since many fall within the expected range of recognised forms; but some may have done so; and in some cases the birds may still be found there if sought for, as with the Cahow on Bermuda, while in the others it should not be impossible to find at least their remains, as with the petrels of St. Helena.

Actually, it appears that petrels are far more likely to be overlooked than exterminated in any but the barest and simplest of sites, such as the naked peak of Guadalupe Island. Even in the British Isles the magnitude of the Manx Shearwater colonies of the south-west of Ireland and the Inner Hebrides was long overlooked in favour of more publicised sites, so that it was possible to find a colony of the order of a hundred thousand birds flourishing forgotten on the mountain tops of Rhum (*Scot. Nat.* 69: 21). Elsewhere in Europe even now extraordinarily little seems to be known about the shearwater colonies down the Atlantic coast and in the Mediterranean, a matter of some importance to us because if any of the races of *Puffinus puffinus* should be found breeding close together in the area where their distribution at sea overlaps, along the west coast of Iberia or around Sardinia, Sicily and Tunisia, in the way now reported to occur with their local representatives in New Zealand (*Notornis* 12: 59), we may have to reconsider a passing suggestion by the two people who originally discovered it, the late H. F. Witherby and P. R. Lowe (*Bull. Brit. Orn. Cl.* 50: 83) that the Balearic Shearwater *Puffinus* (*p.*) *mauretanicus* should be treated as a distinct species, a new one for the British List.

In the Atlantic generally, the most important problem is the distribution of the gadfly petrels. Detailed information is still needed about the behaviour of the large and small forms of Soft-plumaged Petrel *Pterodroma mollis* nesting near each other at different seasons at Madeira (*Ibis* 99: 182), and their relationship to the typical form of Tristan da Cunha in one direction and the rather similar Cahow of Bermuda in the other; also the relationship of all these birds to the Capped and Jamaica Petrels of the Antilles. But such a comparison is still difficult without information on the gadfly petrels definitely known to have existed in the past at one intermediate site to the south, St. Helena, or those which must surely once have occurred at another intermediate site ideally suited for them to the west, the Azores. Rather little seems to be known about any of the petrels of the Azores yet (J. de Chavigny and N. Mayaud, *Alauda* 4: 133; N. Mayaud, *Alauda* 9: 313) and the most elusive group of all could easily have been overlooked here, especially if they nest, as they often do elsewhere, in the winter. Elsewhere in the Atlantic Audubon's Shearwater *Puffinus lherminieri* has so far only been recorded breeding in the north, but one specimen has been seen on Ascension, and what appear to be bones of this species have been found on St. Helena, while it has been seen in the Gulf of Guinea, so it may breed somewhere in this region, and quite possibly also on another likely site where no shearwater has yet been reported, South Trinidade, as well. The other shearwater reported from the St. Helena bone deposits, *Puffinus pacificus*, also may still occur there, among other species.

In the Indian Ocean the Mascarene Petrel *Pterodroma aterrima* seems likely still to occur undetected in the great cliffs of Réunion, together perhaps with other unrecorded species, and various petrels might also occur elsewhere in the Mascarene Islands, notably on the offshore reefs of Rodriguez, which provided British Museum specimens of Wedge-tailed Shearwaters in 1874, but have apparently never been investigated since, though terns at least still survive there (*Sea Swallow* 12: 9, 20). Further north in the Indian Ocean Jouanins' Petrel *Bulweria fallax* and the race *persicus* of Audubon's Shearwater must breed somewhere around the Arabian Sea, though there is still little indication where, except for reports of possible burrows on the Kuria Muria Islands and on islets at the mouth of the Persian Gulf (Roger Bailey and D. M. Neale *in litt.*); and the Wedge-tailed Shearwater may breed here as well, or in the Bay of Bengal, where the Andamans and Nicobars and islands along the south shores of the East Indies also hardly seem to have been explored adequately yet.

However, the biggest problems occur in the Pacific, where only the periphery has received more than brief visits as yet. In the north the local petrel and shearwater have only recently been rediscovered, and the Madeiran Storm-petrel *Oceanodroma castro* still seems to be missing at Hawaii, which also lacks one of the smaller shearwaters normally characteristic of such groups elsewhere, though it seems unlikely that could have been missed (F. Richardson, *Bull. Bishop Mus.* 218 : 1). It seems likely that many Hawaiian birds also occur further west, but there are still little more than vague hints as to what occurs in the great triangle between Hawaii, Japan and the East Indies, where the Whitney South Sea Expedition came to a halt among hostile Japanese mandates in the 1930s. At least the Hawaiian Shearwater has been recorded on Saipan, and the Black-footed Albatross *Diomedea nigripes* breeding on Agrigan, in the Marianas (C. Jouanin, *Bull. Mus. Nat. Hist. Nat. Paris* 28 : 273, 31 : 477), and the Hawaiian Petrel was collected on 17 February 1862 at Ternate in the Moluccas to the south (specimen at Leiden recorded in the literature as *P. leucoptera*). A well-defined race of Audubon's Shearwater, *bannermani*, also occurs here, together with the little-known Matsudeira's Storm-petrel *Oceanodroma matsudeirae*, perhaps quite extensively if as suggested by R. Bailey it winters south to the Indian Ocean (*Ibis* 107 : 134).

The central tropical Pacific is rather better known because it was worked extensively by the Whitney Expedition, but even so there are still many mysteries, especially where the petrels breed in the inaccessible volcanic mountain summits of groups such as the Solomons and New Hebrides, Fiji, Samoa, Tahiti and the Marquesas along the equator. I have already cited Heinroth's Shearwater and Beck's and the Fiji Petrels among the little-known species occurring here, to which may be added the lost dark phase of the White-throated Storm-petrel *Nesofregetta f. fuliginosa* from Samoa and perhaps Tahiti (*Bull. Br. Orn. Cl.* 77 : 40). Further south most of the islands have also at least been visited, but often only at one season, usually in the southern summer, so that out-of-season breeders such as the Little Shearwater may easily have been overlooked at such sites as the Juan Fernandes group, Easter or the Tubuai Is., or the Magenta Petrel among a variety of species known only from the bone middens on the Chatham Islands, to quote only one of the many archipelagoes around New Zealand, where the development of the petrels as a group reaches a climax.

Comparatively few petrels occur in northern and tropical seas, so it is unlikely to overlook species among their allies once the breeding sites have been discovered, though this may be difficult where they are situated on remote rocks offshore, in coastal or inland cliffs, or on remote mountain tops inland. The situation is different in the huge intermingled petrel colonies of the subantarctic islands of the Southern Ocean, where the number of species present may run into dozens, involving complexes of sibling species whose members breed together, as with the diving petrels, prions, some storm-petrels, gadfly petrels and albatrosses, and even perhaps the giant petrels (W. R. P. Bourne and J. Warham *Ardea* in press). The full variety of species present, especially the smaller ones, may be hard to determine here even in undisturbed colonies. Where the birds have been reduced in numbers and driven to inacessible sites by introduced predators, as is now unfortunately usually the case, and these have to be searched in the climate of perpetual high seas, rain and gales characteristic of the West Wind Zone, it becomes easy to understand why at virtually every site there are species known only from occasional specimens whose status remains obscure, while other obvious possibilities for the local list have not yet been found at all.

However, difficult as it may be to investigate the breeding sites in the far south, the birds are usually well-enough known if only because the gales blow them ashore on mainland coasts. It is among the scattered archipelagoes of lower latitudes that they may be really hard to discover.

4. *Conservation.*

The petrels have evolved adaptations for a naturally secure environment, feeding far out at sea and breeding on oceanic islands devoid of natural ground predators, so that their numbers are normally more likely to be limited by such factors as overcrowding, starvation, disease and natural casualties, notably volcanic eruptions, at the breeding places, than predation. In consequence they have suddenly been exposed to a series of unnatural hazards as man has systematically colonised the oceanic islands of the world, bringing with him a new flora and fauna.

This may affect the birds in a number of ways. First, the one which still receives too little attention, is the influence of introduced herbivores on the physical character of the environment. It can be seen well at some British seabird colonies, such as St. Kilda. If these are left undisturbed the birds plough the ground with their burrows and fertilise it with their excrement until a distinctive breeding habitat is formed, with the soil riddled with holes and covered with a tall, rank growth of loose herbage in which the birds can hide from their natural predators, other birds. As soon as large mammalian herbivores are introduced they clear this surface herbage and tread the ground hard so that the birds can neither burrow nor hide there. Owing to the uncontrolled proliferation of flocks of sheep, the three main islands of the St. Kilda group are now covered with a fine short greensward, on a firm base, and the burrowing seabirds for which the islands are famous are restricted to the steeper slopes and lesser islets. Uncontrolled, the sheep multiply till at intervals famine supervenes, and then die; gulls are increasing, and the slopes are covered with castings containing storm-petrel bones, the eviscerated skins of shearwaters and Puffins, and the remains of dead sheep. Even if this unkind experiment by Nature Conservancy personnel is really necessary, it seems regrettable it should be carried out in the privacy of our best seabird colony.

The remainder of the process may be illustrated by the tale of the Cahow on Bermuda, as elucidated by Mowbray, Murphy and Wingate (*loc. cit.*). At the time of their discovery at the end of the sixteenth century the islands were covered with seabird colonies, including terns, several petrels and a tropic-bird. The first visitors introduced hogs, and any seabirds these left on the main islands the first hungry colonists finished off, reducing the petrels in particular to an insignificant remnant on the outer rocks. Here they bred forgotten and unmolested for three centuries, until during the last war airfield extensions began to infringe their habitat, and an expedition was mounted at the last minute to save them, probably too late to save one and possibly both shearwaters, but just in time to relieve the last ageing Cahows. These were probably suffering some persecution from rats, but in point of fact it was not these but another bird, the tropicbird, which proved the main hazard. Of pleasant appearance and fierce disposition, it had proved capable of charming men and intimidating rats where petrels failed, and was now multiplying to such an extent that a constant stream of prospecting birds seeking nest sites were visiting the Cahow's holes at the time when they first desert their small young by day, killing them.

In fact, it appears that while the first effects of the introduction of mammals to seabird breeding stations is destruction of the habitat and the progressive devastation of accessible breeding colonies, the long-term consequences may be rather different; first the restriction of the colonies to inaccessible sites, and the multiplication of the birds there, and then, if the area available is small, the progressive eviction of weaker birds from the better sites by stronger ones. Species may be exterminated at any stage in this process; by predation, through the destruction of their habitat, whether on the breeding ground, or through oiling or the depletion of fisheries at sea, or through competition with other species in a reduced area of safe habitat. Detailed study is required to discover in what way they may be threatened, and how it can be counteracted, because the situation may be very different with different species. In point of fact it seems likely that the majority of the missing petrels, while reduced in numbers, may be in no immediate danger at all. But with others the situation may be critical, and the judicious use of a protection order, a warden, a length of wire netting, a few artificial nest sites, or a gun against their enemies might still save them. But for this we still need to know more about them.

Summary.

A survey is made of a number of the petrels and their breeding places for which there is little information, and the hazards which may affect their welfare there.

(The suggestion that the Manx Shearwater may need to be split into several species aroused some comment in the discussion, while scepticism was expressed at the idea there may still be new petrels to be discovered, notably in the Azores.)

Annual General Meeting

The seventy-third Annual General Meeting of the British Ornithologists' Club was held at the Rembrandt Hotel, London, at 6 p.m. on Tuesday 20th April 1965 with Major-General C. B. Wainwright in the chair.

The minutes of the last Annual General Meeting held on 28th April 1964 were confirmed. The minutes of the Special General Meeting held on 14th December 1964 were read and confirmed. Arising from the latter meeting, at which members had approved a recommendation by the Committee that the bequest of the tenancy of a house at Tring should be accepted, and that money received under the same bequest should be used to set the house in order, it was stated that the Trustees of the estate had now informed the Club that, in spite of earlier statements, no money had been bequeathed to it. In spite of this the committee considered that it was in the interest of the Club that it should accept the tenancy, and the method of raising the money required was now under consideration.

The adoption of the Report of the Committee and Accounts for the year 1964 was moved by Sir Landsborough Thomson and seconded by Captain C. R. S. Pitman.

It was proposed by Mr. C. W. Mackworth-Praed, seconded by Mr. C. J. Mead and resolved:—

that Mr. R. S. R. Fitter be elected Chairman *vice* Major-General C. B. Wainwright who retires under rule 1.

that Dr. J. F. Monk be elected Vice-Chairman *vice* Mr. R. S. R. Fitter on his election to Chairman

that Mr. M. W. Woodcock be elected Secretary *vice* Mr. C. J. O. Harrison who is retiring after one year in office.

that Mr. C. J. O. Harrison be elected to the Committee *vice* Mrs. B. P. Hall who retires in rotation.

A vote of thanks to the Auditors Messrs. W. B. Keen and Co. was proposed by Mr. P. Tate and seconded by Mr. L. R. Romer.

A vote of thanks to outgoing officers and committee members was proposed by Captain C. R. S. Pitman and seconded by Mr. M. W. Woodcock.

B.O.C. Meeting 1965-66

There has been a growing concern among some members of the Club at the increasing cost of the monthly dinner which this year has gone up to a record 25/– per head.

At a committee meeting held on the 3rd June it was agreed that the Secretary should look into possible alternatives to the formal dinners at the Rembrandt Hotel with a view to reducing costs, allowing more time for talks and discussion and making for a generally more rewarding evening.

As an experiment, which it is hoped that members will support, three buffet suppers have been arranged for the forthcoming season, in November, January and March, at which there will be opportunity for a talk or discussion before and after the supper. The cost, while not yet determined, will be considerably less than that of the dinner.

Full details of the meetings will be circulated with the *Bulletin* in the usual way.

Joint Meeting with the B.O.U.

On 19th October the annual joint meeting with the B.O.U. will take place at the Natural History Museum at 6.30 p.m. when a buffet supper will be available.

It is proposed to hold a Special General Meeting of the B.O.C. at 6.0 o'clock that evening in order to implement a resolution passed at the last Special General Meeting held on the 18th May to the effect that the rule whereby 50 members must be present at a meeting in order to amend the rules of the Club should itself be amended. It is also intended to put a resolution that the Barrington Trust Fund should be liquidated in order to pay for essential repairs to the Club's house at Tring. Both these matters will require the presence of 50 members and full details of the resolutions to be put and a notice of the meeting will be circulated in ample time for consideration and reply.

A Cinnamon Teal x Northern Shoveler hybrid

by JAMES M. HARRISON AND JEFFERY G. HARRISON

Received 10th December, 1964

The subject of this communication is a bird of the year, having been bred in captivity by Mr. John Hall of Ixworth Game Farm, Suffolk, in the spring of 1963. It is a male and is now preserved in our collection.

The male parent was the Cinnamon Teal, *Anas cyanoptera* Vieillot, the duck a Northern Shoveler, *A. clypeata* Linnaeus.

In appearance this bird is a typical Shoveler species, and as a drake it evinces little sexual dimorphism, in this respect of course conforming to the southern group of Shovelers, particularly the Australian Shoveler, *A. rhynchotis rhynchotis* Phillips.

Although this bird died in July, it should be noted that when it was prepared, its moult was to all intents and purposes complete, and that therefore its characters were fully developed and no further significant alteration would have occurred. There was no sign of any eclipse plumage developing, but this was probably due to ill-health.

The following are the plumage details:—

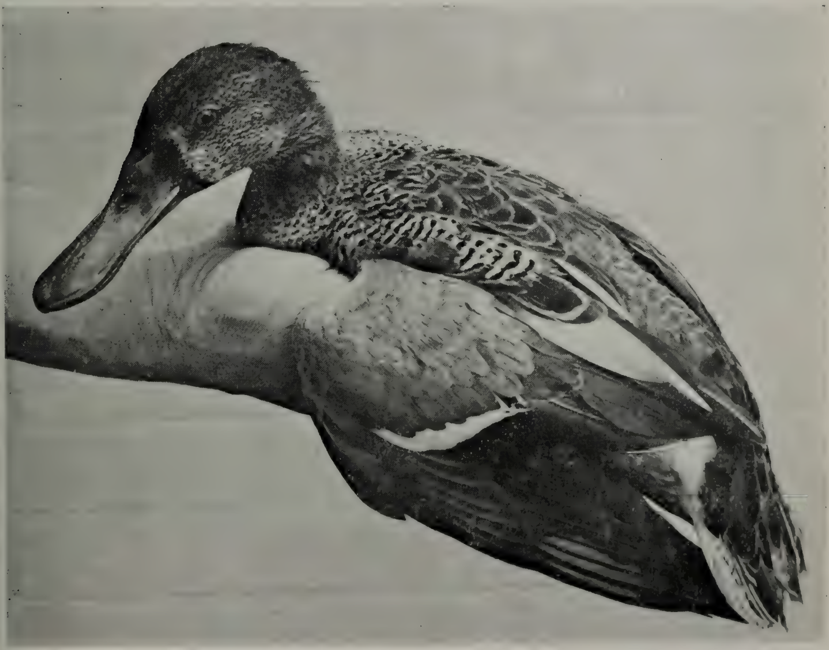

Photo: Pamela Harrison

Hybrid Cinnamon Teal x Northern Shoveler.

UPPER PARTS:

Back adjacent to neck: this area is a mixture of dark sepia, the feathers edged narrowly with pale Tawny Ochraceous (Ridgway, Pl. V.4), the dark sepia tending to form an irregular triangular area with its apex directed caudalwards.

Mantle: this is very similar: on either side the short scapulars are conspicuously barred blackish-sepia and broad Orange-Ochraceous (*l. c.* Pl. V.3). The median scapulars are sepia, edged Tawny Ochraceous and with pale shaft streaks of same colour, while the longer of the series are Pale Blue (*l. c.* Pl. IX.16). The longest scapulars are rich sepia, some having a pale, near white, shaft streak.
Lower back and rump: pale sepia, the feathers edged narrowly with Drab (*l. c.* Pl. III.18).
Upper tail-coverts: similar to lower back and rump.
Rectrices: central pair rich sepia, very narrowly edged pale drab. Rest pale sepia obliquely patterned on outer vanes with brownish-sepia and edged fairly broadly with pale drab.

UNDER PARTS:

Whole of breast and belly as far as vent, pale drab with a large admixture of Liver Brown (*l. c.* Pl. IX.4), the whole area being fully marked with dusky sepia crescentic barring; the areas of maximal suffusion of liver brown and crescents being over the breast and at the vent, though in this latter situation the spots and sepia markings are much smaller.
Under tail-coverts: pale drab with dusky sepia markings; a few feathers are mainly sepia, but with the basal half to two-thirds drab, finely vermiculated sepia.
Rectrices: pale greyish-sepia.
Flanks: Wood Brown (*l. c.* Pl. III.9), broadly marked with dusky sepia V- and U-shaped markings, posteriorly Chestnut (*l. c.* Pl. IV.9).
Wing: (upper surfaces).
Coverts: Glaucous-Blue (*l. c.* Pl. IX.19).
Speculum: dull bronze-green, broadly edged above by whitish; below very narrowly whitish.
Primaries: sepia.
Secondaries: sepia.

HEAD AND NECK:

Crown: dark sepia.
Nape and back of neck: uniform sepia, less dark than crown.
Lores: anteriorly dark sepia extending upwards on to crown. A dull pale crescent runs from the dusky chin in front of the eye and upwards slightly above it. This marking is freely and finely spotted with sepia.
Cheeks: Isabella Color (*l. c.* Pl. III.23) freely and finely spotted with sepia. Over ear-coverts and on sides of neck dull greenish-blue striations. Lower neck above and below, Liver Brown closely patterned with bars, spots and U-shaped markings. Anteriorly the neck is Fawn Color (*l. c.* Pl. III.22) striated with small dusky sepia spots. There is a strong sepia chin patch.
Wing: (under-surface)
Under wing-coverts: white.
Axillaries: white.
Fore edge of wing: pale drab somewhat mottled.
Under tail-coverts: Isabella Color with heavy sepia markings of blackish-sepia.
Retrices: greyish-sepia.

SOFT PARTS:
Iris: amber.
Bill: L.M. dull greyish-green, dusky at tip.
U.M. wax yellow, tip dusky.
Tarsi and toes: wax yellow, webs and nails dusky.
Measurements in mm.
Wing: = 212
Bill:
Length from feather margin = 56.5
Width at nostrils = 15
Width at widest point = 21.5
Tarsus: = 37
Middle toe without claw = 43
Tail = 70
Pectoral girdle (articulated)
Sternum:
Crista = 77.5
Upper width = 31
Width at lower end = 36.5
Coracoid = 41
Scapula = 59
Furcula = 30
Femur = 36.5

Discussion and Summary

This is a hybrid between two species included in Delacour's group of seven "Blue-winged Ducks", which are highly specialised and which represent a distinct line of evolution, differing from other groups of dabbling ducks (Delacour and Scott, 1956). The least specialised are the two species of Blue-winged Teal *i.e.* the Garganey *Anas querquedula* Linnaeus and *A. discors* Linnaeus. Then there follows in order of increasing specialisation, the Cinnamon Teal, Red Shoveler *A. platalea* Vieillot, Cape Shoveler *A. smithi* Hartert, Australian Shoveler and Northern Shoveler.

The interesting feature of this hybrid is that it has revealed characters which may be described as intermediate between the two parent species along the evolutionary line of the "Blue-winged Ducks", although several of the features are found in neither of the parent species and can therefore be described as reversionary.

All the striking features of the drake Northern Shoveler have been suppressed, but others have been exposed which strongly suggest the Australian Shoveler, for which it could easily be mistaken on superficial examination, while others suggest both the Red and Cape Shoveler.

These characters may be summarised as follows:—

(*a*) the pale facial crescents are similar to the Australian Shoveler and tend to meet under the chin, leaving a dark chin spot. This character was also revealed in a hybrid Red Shoveler x Northern Shoveler (Harrisons, 1963), so that the broad pattern of the head of these two hybrids is identical.

(*b*) the mottled chestnut belly and absence of any white on the upper breast resembles both the Red and Cape Shovelers. In the Red Shoveler x Northern Shoveler hybrid referred to above, a striking white neck ring was revealed suggestive of the drake Mallard. It would seem therefore that when the Northern Shoveler hybridises with one of the less specialised of the "Blue-winged Ducks", such as the Cinnamon Teal, the white breast shield is totally suppressed, whereas when the cross occurs with a more specialised species of the group such as the Red Shoveler, then the white breast shield is merely reduced to a white neck ring.

(*c*) the general colour of the cheeks and crown resembles the Cape Shoveler, but with traces of the characteristic blue-green of the Australian Shoveler.

(*d*) the blue and white long scapulars are approximately as highly developed as in the Australian Shoveler, while the pale chestnut short scapulars with strong dark bars are similar to the Red Shoveler.

(*e*) traces of black in the under tail-coverts are similar to the Cape Shoveler.

The findings in this hybrid strongly support Delacour's grouping of the "Blue-winged Ducks" as a distinct evolutionary line and our own views already expressed elsewhere, that reversionary characters exposed by hybridisation have evolutionary significance (Harrison, 1964).

Acknowledgments

We are extremely grateful to Mr. John Hall for allowing us to study this hybrid and for presenting it to us after it had died. We are also very grateful to Dr. Pamela Harrison for her photograph.

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On the roosting habits of the Black-winged Kite, *Elanus caeruleus* (Desfontaines) in Tanzania

by A. M. MORGAN-DAVIES

Received 25th May, 1965

The vegetation of much of Northern Tanzania, immediately south of Arusha, is open grassland with scattered thorn trees of varying density from single isolated trees to thick "bush" country.

For the short period of March and April 1964 it was common to see large numbers of *Elanus caeruleus* hovering or gliding over the open grasslands in search of food, and for many days it was a mystery where these hundreds of birds roosted at night. As a professional collector of birds for Zoological Gardens I spent a certain amount of time collecting at night and it was on one such occasion, in company with my wife, that the spotlight picked out a small isolated *Balanites aegyptiaca* tree. From a distance of two hundred yards the tree looked as if it were covered with snow but on closer examination was found to be a roosting colony of no less than eighty *Elanus caeruleus*. The tree was approximately ten feet high with a spread of about six feet compelling the birds to congregate so close they were almost wing to wing. The amount of excrement, accumulated possibly over a period of years, added to the illusion of a snow-covered tree.

The spot-light, directed on to the roosting birds at a range of six to ten feet, did not cause any considerable alarm and, like many Raptores, provided there was no sudden sound or movement, they remained undisturbed to the extent they could be almost picked from the tree by hand. They made no attempt to savage their captor with their beak but freely used their talons. When finally disturbed the flock would scatter in all directions but soon re-alight on any suitable bush or other thick patch of vegetation that projected above the grass-line.

A second similar, but slightly smaller, roosting colony was found the same night a short distance away.

Judging from the number of roosting birds congregated on to these two trees on this and subsequent nights, the species appears to favour certain particular roosting trees on to which they converge each evening from a radius of many miles.

From the limited literature available to me I am unable to find records of any similar large scale communal roosting habits of other Raptores and, on this basis, I have recorded these observations.

Mr. R. K. Brooke has recently recorded (*The Ostrich* xxxvi, p. 43) observations on the roosting habits of *Elanus caeruleus* in the Salisbury District of Rhodesia. The bird here "habitually roosts in small flocks" in reeds and in a bed of young Carolina Poplars, the number varying from five to thirty.

Winter habitat of *Acrocephalus dumetorum* Blyth

by G. Diesselhorst

Received 25th January, 1965

K. D. Smith (1964) reports on the finding of a skin of Blyth's Reed Warbler from Eritrea in the collection of the British Museum which had previously been misidentified as *Acrocephalus scirpaceus*. He suggests that other specimens observed wintering in the swamps (mangroves) might have been *dumetorum*. I would think the latter conclusion is not very well substantiated by what is known of the habitat of Blyth's Reed Warbler in the Asiatic winter quarters of the species. Whistler (1949) gave an excellent account of the winter habitat in India: "The observer in India must not be deceived by the name of Blyth's *Reed*-Warbler, for on passage and in winter quarters the neighbourhood of water has no special attraction for this species. In winter it is a bird of thick cover, found in any type of country other than thick forest . . . ". About the same is mentioned, for instance, by Ali (1953) for South-west India and by Henry (1955) for Ceylon. I myself watched and collected the bird on passage in the Nepal Duns in April 1962 in exactly the same type of country where it was common at times. I found the species in thick cover of secondary growth and in the outskirts of forest, but I never met with it in swampy localities in the same area and season. The behaviour of the bird reminded me more of a *Sylvia* of the *borin* type than of a Reed Warbler (*A. scirpaceus*). It would be surprising if the species keeps to a different general type of habitat if it really occurred in Africa other than quite exceptionally.

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On hybridisation of Indian and House Sparrows

by E. I. Gavrilov

Received 22nd December, 1964

I consider that the Indian (*Passer indicus* Jard. et Selby) and the House (*P. domesticus* L.) Sparrows are separate species, which are characterized not only by essential differences in biology and by some overlap of their ranges, but also by distinct morphological differences (Gavrilov & Korelov, in press). These last are: (1) cheek colour, (2) "speculum" colour, (3) wing structure, (4) colour of claws and of quills of the under tail-coverts and (5) weight. Based on these differences we found 7 birds in a series of 110 sparrows, which presented in different combinations the morphological character of both species. Some sparrows had wings as in *P. domesticus* and the cheek coloration of the Indian species, while in others the reverse was found. All specimens were obtained in the Djambul region, where both species are resident. Comparing the sizes and the weights of these birds with the same characters in Indian and House Sparrows (Table) the only conclusion one can draw is that 7 sparrows judged on size, weight and colour are intermediate between the Indian and the House Sparrows and they are therefore probably hybrids. Specimens showing the intermediate characters of Indian and House Sparrows were also obtained by N. A. Zarudny (1896).

Table

Size and weight of Indian and House Sparrows and their hybrids

Measurements in mm. and gr.	Species and hybrids	Min	Max	Mean	No. measured
Total length	*P. indicus*	152	170	159·6	62
	P. indicus x *P. domesticus*	155	168	161·8	5
	P. domesticus	159	170	163·7	23
Wing length	*P. indicus*	72	83	76·8	70
	P. indicus x *P. domesticus*	73	79	76·4	7
	P. domesticus	75	83	78·6	33
Bill length	*P. indicus*	8·0	9·4	8·9	40
	P. indicus x *P. domesticus*	8·8	9·2	9·0	7
	P. domesticus	8·8	10·2	9·4	28
Bill depth	*P. indicus*	6·4	7·7	7·3	40
	P. indicus x *P. domesticus*	7·2	8·0	7·4	7
	P. domesticus	7·1	8·1	7·6	28
Weight	*P. indicus*	22·5	28·5	24·8	70
	P. indicus x *P. domesticus*	25·5	28·5	26·4	7
	P. domesticus	25·5	31·7	28·3	32

There are two different opinions. Some authors consider the hybridisation of these sparrows to be very rare (Dolgushin, 1948), while it is disclaimed by others (Sudilovskaya, 1957). Our data on the biology of these birds in their common distribution show that though in general the House Sparrow starts to nest considerably earlier than the Indian species, part of the population commences to breed simultaneously with Indian Sparrows. This is the case with the birds of one year old and when the first clutch is lost. Moreover these species may live side by side and often they build in the same trees. The above facts suggest that hybridisation between these closely related species, although rather rare is nevertheless not unknown.

The very high viability and reproductive activity of sparrows leads to some curious cases. N. A. Zarudny (1896) mentioned a pair of birds consisting of male *Passer indicus* and female of *Emberiza bruniceps*. The interesting details of this unique finding are given by the author who made observations in a hide a hundred yards from the nest using a pair of field-glasses. At first the bunting arrived and slipped into the nest. About ten minutes later the sparrow arrived with a green caterpillar which he gave to the hen. It next appeard some minutes later with a long straw and began to put the straw between small twigs hanging over the nest. Having finished this work it flew off and the bunting came out of its nest and pushed the straw off to the ground. This was repeated a few times; the sparrow probably desired to build a roof to the nest as is customary in this species, but the bunting did not like this because it was accustomed to seeing above its head a blue sky though through a thicket of a bush, and it was in consequence determined to destroy the roof.

" . . . I found two eggs in the nest already, one of which . . . I took. After four days I visited the nest again. There were now three eggs in the nest above which the sparrow, in spite of the protests of the hen was set on building the prominent roof . . . Near the nest, on the ground and in the grass there was plenty of straw, feathers and down; they probably had been brought by the sparrow but were rejected by the hen—the bunting." (Zarudny, 1896, pp. 251–252).

It is appropriate to note a fact supporting the specific distinction of the Indian Sparrow. House Sparrow hybridises with Spanish Sparrow very easily. There is a hybrid population of these birds in North Africa, in Italy and in Mediterranean islands, where about 15 subspecies have been described in hybrids. *Passer domesticus italiae* Vieill., which is a subspecies of hybrid origin*) occurs throughout Italy where the parent forms are absent (Meise, 1936; Bachkiroff, 1953). But hybrids between the Indian and Spanish Sparrow are very rare, though in Southern Kazakhstan both forms are migratory and arrive in spring almost at the same time and are found rather often nesting in the same forest plantations. N. A. Zarudny (1910) writes on 3 hybrids of Indian and Spanish Sparrows obtained in the autumn of 1902 near Narynkol and in spring and summer of 1909 near Tashkent. A hybrid male of these species was found in Tadjikistan, where a pair consisting of male *P. hispaniolensis* and a female *P. indicus* was observed also in the nesting colony of Indian Sparrows situated on a precipice (Golovanova & Popov, 1962).

It should be noted finally that physiological isolation as a specific criterion must be approached in different ways in each separate race. The lack of hybridisation between different forms of birds undoubtedly denotes their specific distinctness, but the presence of hybrid does not necessarily show as yet that they belong to the same species. First of all the hybrids may be infertile or they may bear progeny which is infertile. The limited fecundity of hybrids also indicates that a differentiation of birds has occurred. But fertile hybrids bearing quite fertile progeny is not unquestionable evidence that they belong to different forms of the same species. The fact is that the simplicity of structure of birds' reproductive organs considerably facilitates interbreeding and hybrids not only at the level of the species but also at the level of the genus can be found repeatedly in nature and in captivity; the hybridisation often occurs even in higher taxa than that of the genus (Dementiev, 1940). Since it is natural that two closely related species that have diverged only in recent times will interbreed where the isolating mechanisms have been ineffective (such as asynchronism of breeding, behaviour, voice, coloration, chromosome incompatability and so on). Hybrids can therefore be used for revealing the affinities of closely related species, but for establishing the same species other and wider criteria should also be used, ecological, morphological, geographical and so on.

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* There is another point of view: J. M. Harrison (1961) considers that *P. d. italiae* is an intermediate stage of evolution of *P. domesticus* from *hispaniolensis*.

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The author expresses his thanks to Prof. I. A. Dolgushin, Dr. M. N. Korelov, Dr. J. M. Harrison, Dr. Sálim Ali and Dr. B. Biswas, who so kindly consented to read the manuscript and made a number of critical remarks. I am grateful to Miss T. Levitina also for helping in translation.

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An albino brood of *Pycnonotus barbatus* (Desfontaines)

by R. K. BROOKE

Received 3rd May, 1965

In November, 1964 a nest of this bulbul was found near Marandellas in a garden of an aviculturalist. It contained three young whose emerging feathers were white instead of dark grey-brown. He moved the nest into a cage and so placed it that the parents could continue to feed the young which they did. The young died in February, 1965 for no very obvious reason: two were apparently injected with formalin and given to Mr. J. S. Mills of Salisbury who gave them to me. They are now in the National Museum, Bulawayo. The third albino youngster is no longer available.

Through the courtesy of the Director of the Queen Victoria Museum, Salisbury, I borrowed two normal adult specimens of the Black-eyed Bulbul to assist in formulating the following description. The yellow under tail-coverts retain their usual shade. The bill, legs, claws and eye wattles are pale horn instead of blackish. The remiges and rectrices are very pale buffish-white including the shafts and this also applies to the upper wing-coverts. The formalin makes it impossible to open the wings to examine the under coverts. The contour feathers are white with dull brown bases whereas a greyer shade occurs in normal birds. The heads differ: one has dull brown feathers mottled with pale yellow on the frons and crown, no yellow on the throat and the rictal bristles varying from pale gold through horn to brown, each being one or more colours apparently haphazardly. The other head has a pale brown crown with some dark brown feathers in the frons, the rictal bristles are even more variable with one nearly black and there is a slight yellowish wash on the throat extending on to the sides of the neck. The legs of this second bird are a shade darker than those of its sibling.

I conclude that two groups of genes control the dark colour of *Pycnonotus barbatus* and that in these two specimens, the major one is non-operative. Hence the generally white appearance of the feathers. The minor group which is operative affects the bases of contour feathers, the frons and crown, the rictal bristles and perhaps the bare parts. The yellowish wash on the throat of one specimen suggests that the genus *Pycnonotus* particularly in the enlarged sense used by Rand (*Fieldiana Zoology* 35 : 6 Notes on African bulbuls) is an attempt, a very successful attempt, by a forest family to invade the savannas. During the course of this expansion yellow pigments have become scarcer in the plumage thus producing the dark brownish bulbuls out of green forest birds. That this is a comparatively recent development is suggested by the taxonomic problems of the *P. barbatus*, *nigricans*, *capensis* complex.

First male of *Ploceus ocularis tenuirostris*

by M. A. Traylor

Received 3rd March, 1965

Ploceus ocularis tenuirostris Traylor (1964, *B.B.O.C.*, 84: 83) was originally described on the basis of three females from Ngamiland, and the only other known specimen was a female from Kabulabula in the Transvaal Museum. Now, through the generosity of M. P. Stuart Irwin and the National Museum of Bulawayo, I have a male specimen of *tenuirostris*, collected at Mambova, about 50 miles west of Livingstone on the Zambesi River, on 20th February 1964 by C. W. Benson.

The male has the slender bill characteristic of *tenuirostris*, although the difference between this specimen and the most slender-billed males of *crocatus* is not so marked as in the females. Comparative measurements of males are:

	Bill length	*Bill width*
crocatus (25)	18–21 (19.6)	6.8–8.3 (7.4)
tenuirostris (1)	20	6.7 mm.

In colour the single male of *tenuirostris* does not differ in any way from the long series of *crocatus*. Although it is always chancy to generalize from one specimen, it appears that the characters of *tenuirostris* are more accentuated in females than in males.

The occurrence of *P. o. tenuirostris* at Mambova is an extension of range across the eastern tip of the Caprivi Strip from Kabulabula, on the south bank of the Chobe River.

The River Warbler *Locustella fluviatilis* (Wolf) in Barotseland, south-western Zambia

by C. W. Benson and M. P. Stuart Irwin

Received 26th April, 1965

Despite a fairly extensive western palaearctic breeding range, records of the River Warbler *Locustella fluviatilis* in its winter quarters remain exceptionally few. Indeed it cannot be stated with any certainty where the bulk of the population does winter. There are certainly fewer records than for the Olive-Tree Warbler *Hippolais olivetorum*, with a much more restricted breeding range; compare the respective distribution maps in Voous (1960).

Long & Benson (1960) give a single record from Nyasaland (now Malawi) and mention very briefly its status as given in the literature for southern and eastern Africa. It is of interest that one of us (Irwin) on 26th March, 1965 collected a River Warbler near Imusho (17° 35′ S., 23° 24′ E.), in extreme south-western Barotseland, near the border with Angola and the Caprivi Strip. It is an adult male in very fresh dress, wing 74, tail 55 mm. It weighed 19 grammes, and carried a considerable amount of body fat. The bird was collected low down in a dense thicket alongside a track through mixed *Acacia giraffae/Baikiaea plurijuga* woodland on Kalahari Sand, about half-a-mile from the Mashi (Kwando) River. No further individuals were recorded, though a Thrush Nightingale *Luscinia luscinia* was collected the same morning in similar habitat. Unless they were singing the two species would be difficult to tell apart in the field.

The only previous Zambian specimen was collected in reeds fringing the Zambezi 30 miles upstream from Zumbo, which is on the border with Mozambique, 25th December (Alexander, 1900). Tree (1963) reports seeing one at close range on an island of reeds floating down the Zambezi at Feira (the station on the north bank of the Zambezi, opposite Zumbo), 6th April. From the habitat it was unlikely to have been a Thrush Nightingale.

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CONTRIBUTORS

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Authors introducing a new name or describing a new species or race should indicate this in their title and display the name prominently in the text followed by *nom. nov.*, *sp. nov.*, *subsp. nov.* as appropriate. In these descriptions, the first introduction of the name should be followed by paragraphs for "Description", "Distribution", "Type", "Measurements of Type", "Material examined" and further sub-headings as required.

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DINNERS AND MEETINGS FOR 1965

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The six hundred and twenty-seventh meeting of the Club was held at the Rembrandt Hotel, London, on the 21st September, 1965.

Chairman: Mr. R. S. R. Fitter

Members present 21; Guests 4

The speakers, Sir Landsborough Thomson and Mr. Stanley Cramp have kindly provided the following accounts of their respective communications:—

Orthography of the name *Ammoperdix heyi* (Temminck)

by A. Landsborough Thomson

In an editorial capacity I have recently been challenged about the spelling "*heyi*", in the name *Ammoperdix heyi* (Temminck), on the supposed ground that the author had intended to name the species after someone called HAY, and that the original name thus contained a *lapsus* requiring emendation to "*hayi*" as allowed by the International Code of Zoological Nomenclature. In fact, when Temminck (1825) gave the name "*Perdix Heyi*" he did so expressly in honour of a collector called HEY, and there is abundant evidence that the personal name was so spelt. Thus, no *lapsus* and no occasion for emendation.

Although the correct spelling "*heyi*" is used in most modern works, the other is common in the older literature and it is apt to be resuscitated from time to time. It therefore seems desirable to put a full statement on record, however trivial the point at issue. Moreover, as a cautionary tale it is not without interest!

In unravelling the development of the misunderstanding, I have relied to a large extent on the synonomy published by Ogilvie-Grant (1893); I am also indebted to R. Lévêque and C. J. O. Harrison (personal communications) for certain references. The main steps seem to have been as follows:

(1) Gray (1844) was the first to vary the specific name, in the combination "*Caccabis Heyii*", but as he misquotes Temminck as having used this spelling it may have been merely a slip. It may, on the other hand, have represented a preference for a different way of latinizing the German personal name; but in any event the emendation is not permissible, so this variant, although it has been copied by others, is really

irrelevant. Incidentally, Gray used the English name ''Hey's Partridge''; others have done so since, but more commonly the bird shares with its sole congener the names ''Sand-partridge'' and ''See-see''.

(2) More to the point is that Rüppell (1845) was apparently the first to misspell the specific name with an ''*a*'', in the combination ''*Ptilopachus Hayi*''. This was in a mere list and can only have been a slip, as Rüppell (1835) had earlier used Temminck's name ''*Perdix Heyi*'' and he was thoroughly familiar with its derivation. HEY in fact did all his collecting as a junior member of Rüppell's expedition of 1822–27, and Rüppell stated that it was from himself that Temminck had received the particular specimens (''von mir erhalten Exemplaren''). He also rather sourly mentioned that his own suggestion of ''*P. flavirostris*'' (Ms. name) had been arbitrarily (''willkürlich'') passed over by Temminck. I am informed by Professor R. Mertens (personal communication through Dr. J. Steinbacher, Frankfurt a. M.) that the misspelling HAY very occasionally occurs in Rüppell's manuscript letters and memoranda, but that the personal name is in these normally given as HEY (standardised in the published version).

(3) Heuglin (1873) used the name ''*Ammoperdix hayi*'' and imported much confusion into the synonomy by misquoting Temminck, and also Rüppell in 1835, as having used ''*Perdix Hayii*'' (*sic*), when they had written ''*Heyi*''; and further by misquoting himself as having used ''*Ptilopachus Hayi*'' in 1856, when in fact he had then written ''*Heyi*''. He also attributed ''*hayi*'' to at least three other authors (a complete check has not seemed worth making) who in fact used ''*heyi*''.

(4) Hartert (1921) retained ''*Ammoperdix heyi*'' although saying that the bird had been ''von Hay, Rüppells Begleiter und Praeparator gesammelt''. He was aware that other spellings had been used (''Name später in *Hayi* und *Heyii* verbessert''), and it was presumably what he took to be a deliberate emendation by Rüppell (1845) that put him wrong about the personal name. That he did not accept the emendation in the scientific name reflects the deviationist view in favour of immutable original orthography that had a vogue at the time.

(5) Stresemann (1938) was misled by Hartert's error in the personal name into stigmatising the retention of ''*heyi*'' as pedantic: ''fährt man in geistloser Pedanterie fort . . . *Ammoperdix heyi* statt *hayi* zu schreiben''. The principle is unexceptionable, but the particular example was unfortunate. I am indebted to him (*in litt.* 1965) for the information that the source of his misunderstanding was Hartert, who is not actually mentioned in the publication. I am also grateful to Professor Stresemann for a reference to the biography of Rüppell by Mertens (1949), in which much information about HEY is to be found that probably was not widely available before.

Earlier information about HEY was given by Temminck, who stated that the two specimens figured (male and female) were ''tués par M. Hey dans les déserts á Acaba en Arabie''. He then went out of his way to show how deserving the collector was of being immortalised in avian nomenclature: ''Les dangers affronté par M. Hey dans le seul but de se rendre utile: les courses périlleuses enterprises pour faire des découvertes dans une terre jadis classique transformé aujourd'hui en un désert affreux, sont des titres que nous nous faire valoir et auquels l'hommage d'une dédicace répond d'une manière très faible relativement au mérite personnel''.

That might have served as an epitaph, but in truth the collector cuts a much less heroic figure when seen at close range through the eyes of Rüppell, as recorded in memoranda and letters quoted by Mertens. HEY was a Rüdesheim ''surgeon'' in his early twenties when he joined Rüppell's expedition, and he died only ten years later. His sole impact on natural history was during the five years spent working with or under Rüppell (who was four years older and lived to be ninety). Rüppell later regretted not having repatriated HEY after the first year, soon finding him unsatisfactory in his work and excessively addicted to alcohol. In these circumstances it was a cause of irritation to Rüppell that in Germany he and HEY were regarded as equals and friends. Rüppell was particularly offended by a picture (reproduced by Mertens) in which the two men were portrayed together, with HEY in a dominant pose. Rüppell waxed sarcastic about this, suggesting that his own likeness should be deleted from the canvas and replaced by a gigantic brandy-bottle; and that underneath should be inscribed the words ''Ecce homo''!

None of this, however, constitutes a reason why the collector should suffer the posthumous indignity of having the correct spelling of his name relegated needlessly to the synonomy.

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Toxic chemicals and wildlife

by STANLEY CRAMP

Toxic chemicals have led to considerable, if sometimes overstated, gains in agriculture, as well as improvements in public health, and many, including most of the herbicides, are not a serious danger to wildlife. Conservationists are not opposed to all chemicals, but mainly to two groups—the organophosphorous compounds and, above all, the organochlorines, which are highly persistent, passing from one animal in the food chain to another, often concentrating in the process, and, in sub-lethal quantities, having serious effects on some bird populations by reducing fertility. In Britain mass deaths of birds led, in 1961, to the voluntary ban on certain organochlorines in seed-dressings, and, later, evidence of declines in numbers of birds of prey, together with the contamination of some foodstuffs, caused restrictions to be extended to most uses of the more toxic organochlorines. There is now clear evidence that most living things, including man, in Britain, are contaminated by persistent pesticides, although in many cases the residues are small and their significance still uncertain. Except for the U.S., Sweden and Holland, few other countries yet have facilities for measuring organochlorine residues, but similar contamination has been found wherever tests have been made, including the Pacific and Antarctic waters. Evidence of any decline in bird populations is limited so far to certain predatory species, partly, at least, because of the difficulties of census work and ignorance of population sizes before the new pesticides came into large-scale use. Amateur ornithologists in Britain have played a major part in gathering evidence of the effect of pesticides on wild populations. In pressing that the ultimate aim should be the elimination of the use of the persistent pesticides, conservationists are now supported by entomologists and others who doubt their long-term efficiency in controlling harmful insects and by those who fear their possible effects on human health. Meanwhile, it is essential to extend the restrictive measures in Britain to the less toxic persistent chemicals, such as BHC and DDT, to prescribe maximum permitted residues in foodstuffs and to give legal force to all control measures.

Minutes of a Special General Meeting

A Special General Meeting was held at the Rembrandt Hotel, London, on Tuesday, 18th May, in order to ratify the realisation of the assets of the Barrington Trust Fund, to pay for essential repairs to the Club's house at Tring.

In the Notice calling the meeting, it was stated that as fifty members were required by the Club rules for this purpose, and attendance was usually less than that figure, proxies should be obtained from members in order to raise the necessary number of votes.

Shortly before the meeting, however, it was learnt that proxy votes would not be acceptable to the Trustees of the Trust Fund, and accordingly the voting was invalidated. It was pointed out that fifty members in person were required to vote in order to change the rules, but it was proposed by Sir Landsborough Thomson and seconded by Mr. C. J. O. Harrison that a meeting for this purpose should in due course be convened, and this motion was passed. It was also proposed by Sir Landsborough Thomson, and seconded by Mr. P. Tate, to take a vote on whether the meeting as constituted would be in favour of utilizing the Barrington Trust Fund and this motion was passed unanimously.

In view of the invalidation of the voting, no proposal could be made which would release Trust Funds sufficient to warrant authorizing the builders to commence repairs to the house at Tring.

Note: Miss C. M. Acland has very kindly offered the loan of the required sum.

The eggs and nesting habits of the St. Helena Sand-Plover or Wirebird, *Charadrius pecuarius sanctae-helenae* (Harting)

by CHARLES R. S. PITMAN

Received 1st May, 1965

Taxonomy: Peters (1934) recognises *Charadrius pecuarius allenbyi* Nicoll as a race of *C. pecuarius*, as also do Meinertzhagen (1930), and Etchécopar and Hüe (1964), but Peters accords specific status to *sanctae-helenae* with which Bock (1958) and others, rightly I consider, disagree. Perhaps *C. p. allenbyi*, which averages smaller and with a tendency to be more brightly coloured below—*vide* Meinertzhagen (1930) "The rusty coloured breast and small size are characteristic"—should be regarded as the end of a cline?

General: Apart from seafowl, the St. Helena race, *sanctae-helenae* of *Charadrius pecuarius* Temminck, locally known as 'Wirebird', is regarded as the only indigenous bird species on this island, though there is reason to believe that also the Moorhen, *Gallinula chloropus* (Linn.), not introduced by man, has long been resident, Benson (1950), having been first recorded in 1718, though it is possible that for a while it disappeared and then later re-established itself. There are no indigenous passerines and those—in considerable variety—and others that are present have been introduced within the past 250 years.

Fossil remains of no great antiquity indicate the existence formerly of a rail which is described by Wetmore (1963) *Aphanocrex* gen. nov. and he records "become specialized for an active life in walking and running on land", which suggests that like *C. pecuarius* it had established itself and become adapted to an unfavourable environment.

Ashmole (1963), too, refers to fossil columbid remains and also records "Forster who visited St. Helena in May 1775" mentioned seeing on Diana's Peak (or on the way there) a "small kind of blue dove, which is said to have been originally found in the country." The widespread deforestation which occurred after the introduction of goats, would have accounted for this bird's disappearance, probably assisted by its value as food. There might also have been an endemic hoopoe. But so far no fossil *C. pecuarius* material has been found. The Wirebird presumably originated, when one does not know, from a chance incursion from the African mainland, some 1,300 miles distant, and despite somewhat unfamiliar conditions of terrain established itself as a breeding species.

With reference to the origin of *C.p. sanctae-helenae*, Bock (1958) offers the theory "The Madagascar *thoracicus* is also very close to *pecuarius* and may represent an earlier invasion of Madagascar by a pre-*pecuarius* stock. Later, *pecuarius* invaded Madagascar for the second time so that today the two species are sympatric." Bock states categorically that a breast band—which *thoracicus* has, but not *pecuarius*—is a "primitive" trait in the genus *Charadrius* and suggests that "If Africa is the original home of the species (*pecuarius*), then this is a case of a peripheral population (*thoracicus*) of a species retaining a primitive characteristic." But he then proceeds to demolish this theory with the alternative hypothesis "that Madagascar is the ancestral home of the species which invaded Africa and gave rise to *pecuarius*, which in turn re-invaded Madagascar."

Therefore, according to Bock, *sanctae-helenae* is not of primitive stock and has presumably developed from an incursion of the island from the African mainland, a claim which perhaps can be supported by the absence of fossil remains.

Arthur Loveridge (*in litt.*) the authority on African herpetology, who now resides on St. Helena, concurs with what another resident informed me when I visited the island in October 1950 and saw a pair of Wirebirds busily feeding in his garden, that the name 'Wirebird' refers to this little plover's rather long, wiry legs. In past literature several authorities are not agreed about the derivation, either claiming its origin to be the wiry legs or the wiry grass (*Cynodon dactylon*) of its habitat. But I am inclined to support the theory that it is the wiry legs to which the popular name refers for I feel the locals were more likely to be impressed by a conspicuous characteristic of the bird itself rather than an association with its habitat. The Wirebird is well depicted on the 3*d.* stamp of the island's 1953 issue of postage stamps. Benson (*in litt.*) "The longer tarsus is immediately apparent to anyone who is familiar with African *pecuarius*".

Habits: In its habits generally *sanctae-helenae* differs little from nominate *pecuarius*, but a character which it shares with *allenbyi*, though not noticeable elsewhere—except at breeding time—is that this island race is mostly found in pairs some of which regularly visit gardens and can be seen foraging unconcernedly close to a bungalow, as I was able to witness. They seem to feed wherever there are suitable conditions such as open grasslands, ploughed fields or large vegetable gardens. Except at breeding time when the majority of these little plovers congregate on the more remote open plains where there is little possibility of frequent disturbance, their distribution which is widespread, can scarcely be described as 'local'.

Population: Loveridge suggests "the total population as something just under a thousand", which is most encouraging as Haydock (1954) who spent three months on the island in 1952 investigating its bird life during the Wirebird's breeding season, estimated that there were some 30 pairs on the main breeding ground and that the total population was about 100 pairs. Haydock discovered eleven breeding grounds, three of which were extensive, another of fair size and the remaining seven, small.

Habitat: St. Helena, then uninhabited, was discovered in 1502 and the introduction of goats in 1513 heralded the speedy destruction of the forests, which were said to cover the island. The Wirebird seems to have been first recorded in 1656 (Benson, 1950) and examples collected in 1842 —now at the British Museum (Natural History)—are of the typical large island race. Could a large new race, with some distinctive markings and laying a large egg, have evolved in some 300 years only? But there is reason to believe that the early visitors (or some of them) erred in their claim that forest covered the island and it seems probable that long before its discovery there had been open spaces which provided *Charadrius pecuarius* with a suitable habitat. Benson (*in litt.*) rightly emphasises "that African *pecuarius* (as I know it, anyway) is never far from water."

Breeding season and nests: As in the case of *pecuarius* elsewhere, climatic conditions on the island evidently determine the breeding season of *sanctae-helenae*, which lies during the drier period of the year, though damp mists, sometimes prevailing throughout the day, are common. The rainy season derived from the south-east trade winds may extend from March to the end of August (which is the wettest month of the year). The island rains, as compared with those on the mainland, lack the intensity which can at times make conditions so adverse for those species which make no nest and lay their eggs on the bare ground. It is possible that an inherent factor—the original mainland climatic influence—has been responsible for determining the breeding season of *sanctae-helenae*. The season during which the eggs are laid may last from October (perhaps even the latter part of September) till January (or even later), certainly four months and perhaps longer (Loveridge has egg records for April and late May); and the nesting habits are generally similar to those of the mainland races. But on St. Helena nests are evidently easier to locate than elsewhere, for Loveridge and his wife had little difficulty in finding nests whenever they went out to look for them. On the first occasion that they undertook a search, in a little over three hours they had located four nests each with one egg, and it may be that eggs—the full set being two—are not laid on consecutive, but on alternate days, for when the four nests were re-visited the following day each still contained only one egg, and one of them which was collected was fresh. During this second visit a further search revealed three more nests—one with one egg, the others with two eggs each; both these c/2 were collected (Loveridge having been asked to obtain a small series) and the eggs proved to be fresh.

The brooding birds were observed again and again, as they left the nest, to cover the eggs, which is customary for the species. The Wirebird's eggs are completely covered all but a circular section some 12 to 18 mm. in diameter, and what is fully exposed rarely exceeds 12 mm. across. The nature of the soil doubtless prevented the eggs from being completely hidden as occurs when this sand-plover nests in sandy or soft soil. Sometimes the ground was too hard for the departing parent to cover its eggs successfully as there was little soil to kick over them and the eggs were then left lying on their sides and very much exposed.

Loveridge observed courtship and mating, as well as the change-over of the brooding bird. On one occasion he watched a female being mated by the male while a nearly month-old chick stood quietly beside them. This seems to suggest that this plover is probably double-brooded.

On the sandy northern shore of Lake Victoria, at Entebbe in Uganda, I found it exceptionally difficult to locate eggs of the nominate race—although there were many nesting pairs—as they were so skilfully covered and as the brooding bird was adept at making an early and undetected get-away. But when I was accompanied by a dog which ranged around, the brooding bird sat tight long enough for her departure from the actual nest to be observed. Also, a rider on horse-back could locate nests with ease, as the parent left its nest at the last moment and only when it seemed the eggs might be endangered. I never tried to locate a hidden nest from a moving car lest one unwittingly damaged the eggs, but Loveridge knowing the location of a nest took a visiting photographer by car "to within 6 feet of the docile bird" sitting on its eggs. Later, after the bird had been induced to leave its nest and when the eggs were being photographed—covered and uncovered—she did everything an anxious parent should do to distract the intruders' attention, including lying in a collapsed state within ten feet or so.

Using a motor-car it is possible to locate easily even the eggs of so exceptionally a wary bird as the East African Greater Bustard, *Ardeotis kori struthiunculus* (Neum.) as described by Archer (1937) "As to the finding of the eggs, it will suffice to say that the use of a motor-car overcomes all difficulty. No bird is keener sighted or more suspicious of man's approach on foot than the Greater Bustard. Yet each and all would walk up to their eggs and settle down on them unhesitatingly when the car was standing in full view within fifty yards."

From my own experience and from the observations of others, one knows how simple, though often unintentional, it can be to find when motoring the nests of shy, African ground-nesting species, such as some of the plovers, coursers and bustards.

At Entebbe, on one exceptionally wet morning in the breeding season—during a deluge—six nests which the brooding *pecuarius* were naturally loth to abandon, were easily located in a small, sandy, short-tuft-grass area.

Melliss (1870) wrote "It lays in the summer months of December and January, two eggs, in colour grey, with black markings . . . makes no nest, but lays its eggs in dry cow dung on the exposed open ground . . . and it is "stated" "slightly covers them, but does not sit upon them." He further records that the "Eggs closely resemble the background and are difficult to distinguish" and that it is "doubtful if it ever leaves the island".

The reference to "dry cow dung" is an interesting observation and an indication that this bird will take advantage of any situation which is soft and friable, to lay its eggs, where soil conditions are otherwise unfavourable.

In the Lake George and Lake Edward region of western Uganda where the soil is hard and where strips of sandy foreshore are frequented by numerous hippopotamuses the scattered population of *C. pecuarius* frequently made use of dry buffalo, dry hippo or disintegrating elephant droppings for a nest site. I found several such nests, as also did one of my Fisheries Officers. The eggs of the Water Thick-knee or Water Dikkop, *Burhinus vermiculatus büttikoferi* (Reichw.) in this locality too were more than once found in similar sites.

The use of dry and disintegrating animal droppings as a nesting site, by *C. pecuarius* is evidently commonplace, for Vincent (1953) records "c/2 amongst dried hippo dung" and Hall (1958) refers to "cow or horse-dung nest sites."

In Northern Rhodesia towards the end of the dry season, I found *C. pecuarius* nesting on sun-baked black soil on the Kafue Flats, a long way from water after the floods had receded. In the blistering midday heat, on 3rd October 1931, I easily found two nests each containing two eggs as the sitting birds were reluctant to leave their eggs under such unfavourable conditions. The two fresh eggs of one set were scarcely covered when the parent at last left as the only loose materials available were some small pieces of broken soil and grass stubs; but, notwithstanding the obvious difficulties, the other set which had been incubated for about a week were so well concealed that only a tiny portion of the top of each egg was visible, and even then I had rather quickly driven away the parent before it could finish covering them completely. Although *C. pecuarius* prefers a sandy or friable soil in which to nest, it is evident that such conditions are not essential, so it should not have been extraordinary for the immigrant sand-plovers to establish themselves on St. Helena and breed under conditions no worse, if not a good deal better, than those in which they are sometimes found nesting on the mainland.

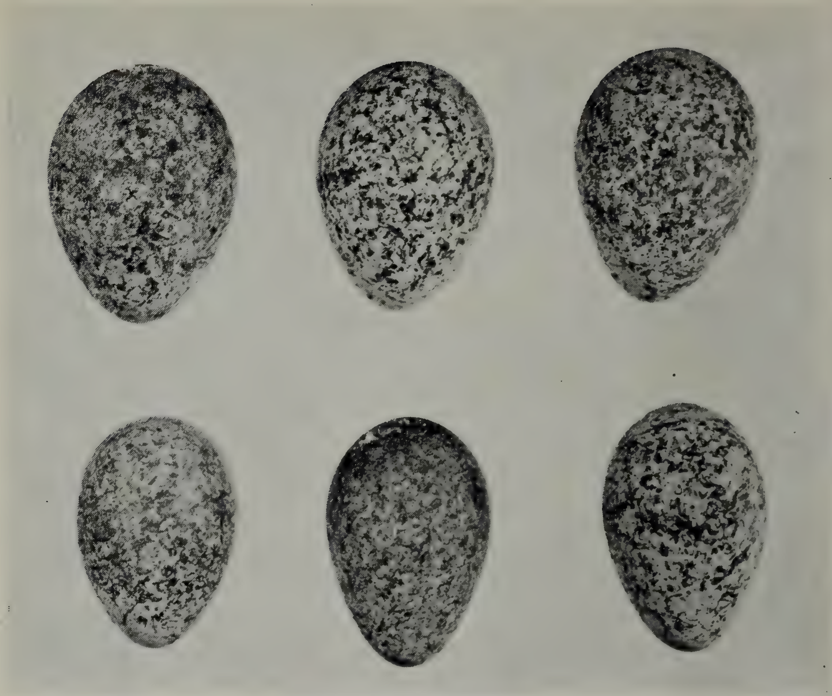
There were other nests of *C. pecuarius* on the Kafue Flats which I did not disturb, as well as a breeding colony, with eggs, of the African Pratincole, *Glareola pratincola fülleborni* Neum. Both species, under the prevailing conditions of furnace-like heat, returned to their eggs as quickly as possible. From the convenient shelter beneath a $1\frac{1}{2}$ ton truck I was able to watch with binoculars some brooding change-overs of each species and it was noticeable that the newcomers of both the sand-plovers and the pratincoles seemed on arrival to have wet breasts which doubtless would have considerably benefitted the eggs. In Northern Rhodesia breast-feather wetting by incubating birds has also been recorded by Wright (1963) in the case of *Lobivanellus senegalus lateralis* (Smith) and by Bainbridge (1965) with reference to *Lobivanellus albiceps* (Gould).

All species of birds have long been protected on St. Helena—since 1894 and some of them much earlier—but by virtue of a scientific permit granted through the courtesy of the Governor, Sir Robert Alford, Loveridge collected a series of eight Wirebird's eggs, 3/2 and 2/1, which he generously presented to the British Museum (Natural History).

Eggs: The eggs of *sanctae-helenae* are typical *C. pecuarius* eggs in respect of coloration and markings as the illustration shows and there is generally no tendency for the markings to form a zone or girdle anywhere around the eggs as is sometimes found in the case of *pecuarius* though some of the markings on an egg in the British Museum (Natural History) collection have formed a blackish cap. Seven of Loveridge's eggs are similarly marked, fairly thickly irregularly and boldly all over with black and sepia mottling and some fine dark streaks, on very sparse underlying grey. One egg has duller, more streaky markings of sepia on a pale greenish-stone ground. The ground colour of the others varies from a warm creamy-buff to creamy-stone, though three of the eggs are faintly tinged a pale grey-greenish or very pale greenish-olive. All eggs are smooth and without gloss and in shape, as the illustration shows, are inclined to be pyriform, though less so than those of nominate *C. pecuarius*. The eggs of both races are large for the size of the bird. Those of *sanctae-helenae* are of rather even size, but are markedly broader and average distinctly larger than those of *pecuarius* from the mainland, as can be clearly seen in the illustration showing the natural-size eggs of the two races.

Loveridge's eight eggs (British Museum 1959, 6.1–5) average 32.48 x 24.4 mm., their measurements ranging from 30.3–33.2 x 23.6 x 24.7 mm. 30.3 and 23.6 mm. constitute respectively exceptionally short and narrow measurements.

Five eggs of *sanctae-helenae* collected by Haydock in 1952 are said to average 35 x 25 mm., which seems to be rather large.



The eggs, natural size, of
Charadrius pecuarius sanctae-helenae above, and
Charadrius pecuarius pecuarius below.

Five eggs of *sanctae-helenae* (at the British Museum, Natural History) the first one taken in 1870, were collected between 1870 and 1911 and average 34.58 x 25.0 mm., with a measurement range 32.3–36.5 x 24.6–25.5 mm.

It will be noticed that Loveridge's eggs, the most recent, average markedly smaller than the five originally collected, as well as Haydock's five eggs (which are not available for check). Is it possible that the eggs (and perhaps the birds) of *sanctae-helenae* are gradually decreasing in size? and perhaps reverting towards the size of those of mainland *pecuarius?*

For comparison, the following are some measurements of the eggs of nominate *C. pecuarius*:—

SOUTH AFRICA (i) McLachlan and Liversidge (1957)
100 eggs average 31.9 x 22.2 mm.: range 28.6–34.4 x 19.0–23.2 mm.
19.0 mm. is abnormally narrow.
(ii) General R. M. Betham (personal communication):
50 eggs average 31.84 x 22.8 mm.: range 30.1–34.1 x 21.0–24.2 mm.
(iii) Eggs personally examined or measurements sent to me.
29 eggs average 31.68 x 22.22 mm.: range 29.2–34.2 x 20.4–23.5 mm.
20.4 mm. for breadth is rather small.

NORTHERN RHODESIA (NOW ZAMBIA): Own eggs, four and two from C. W. Benson. 6 eggs average 30.5 x 21.4 mm.: range 29.3–31.8 x 21.1–21.7 mm.

UGANDA: Fourteen eggs self-collected; two eggs Jackson (1938). 16 eggs average 31.0 x 22.0: range 27.5–32.8 x 21.4–22.7 mm. Measurements of 27.5 mm. (length) and 21.4 mm. (breadth) are abnormally small.

WEST AFRICA—GOLD COAST (NOW GHANA): *Vide* Bannerman (1951). 8 eggs average presumed c. 31.25 x 21.5 mm. maximum 32.5 x 22.0 mm. and minimum 30.0 x 21.0 mm.

Egg-covering: As a result of extensive investigations Hall (1958) is of the opinion, which is doubtless correct, that human disturbance is the stimulus which developed egg-covering. He noticed that a bird disturbed from its eggs by cattle does not cover its eggs, and in my own experience eggs were only partially covered—possibly the bird was brooding them like this—when a dog on several occasions disturbed the parent. Birds flushed from nests by a horseman or a motor car have left the eggs uncovered. When parents change over at the nest, as one would expect, the eggs are not covered.

On St. Helena the Wirebird, many of which are normally in constant contact with settlement and the human population, moves away to nest on open expanses where the possibility of disturbance is negligible. But human intrusion on the breeding ground does result in a measure of egg-covering. Can this be regarded as an inherent characteristic of a species which must have originated from the mainland of Africa and where this procedure is normal?

The newly hatched young also have sometimes been found covered in the nest. This is deliberate and not accidental, for in those cases when the buried young were left uncovered by an intruder, shortly afterwards they were found to have been re-buried.

Solicitude for a down chick can sometimes induce an anxious *C. pecuarius* parent to overcome its normal wariness and behave in quite extraordinary fashion as I once experienced at Entebbe. From the extravagant posturings—again and again it went through the whole of its extensive distraction repertoire—I knew that near at hand it must have a tiny chick (or chicks). But half-an-hour's meticulous search, virtually inch-by-inch of a very small area drew a blank. Then, as the light was failing and the chill of evening set in, the female (presumed) parent, while my back was turned momentarily, deliberately brooded the chick not six feet distant. I was certain that the chick could not have avoided our thorough scrutiny (for I was not alone) and must have been entirely or partially buried. The mate was always near by, but not so actively solicitous.

Downy chick: Haydock (1954) describes the Wirebird's down plumage as "buff streaked black and a tinge of grey, but unlike the eggs", and "The legs were olive-green and not black as in the adult". According to van Someren (1934) the nestling plumage of *pecuarius* is "Crown and back greyish to white mottled and spotted with dark ashy-grey, the dorsum with a dark line, and one on the wing, the dark area of the crown separated from that of the back by a white ring; under surface white". Haydock's description is insufficiently specific to enable a useful comparison of the downy chicks of the two races, although it would appear that *sanctae-helenae* is generally buff, and *pecuarius* grey. For comparative study a series of downy chicks and fledglings of *sanctae-helenae* would be of considerable value.

Nesting behaviour: Haydock (1954) records "The eggs are laid in a shallow depression formed by the bird circling breast down in the grass and the nest is not lined, but small bents and grasses are laid around the site"—these are for covering the eggs. Neither he, nor Loveridge, makes any reference to unoccupied or 'spoof' nests, which is a common characteristic of the mainland *pecuarius.* Haydock also describes how "When approached the sitting bird rises and with its back to the nest circles, kicking the outer bents and grasses over the eggs, then walks away, dragging a wing in feigned injury". Hall (1958) after protracted study of the breeding behaviour of *pecuarius* in South Africa described the egg-covering as "sideways action of the feet before the nest is left", *i.e.* the bird is standing *over* its eggs as it covers them. This agrees with my own observations, as well as with those of van Someren (1934) and many others; it is the sideways shuffle, as the bird rises, which is the basis of the operation, skilfully executed in a few seconds, which Hall has timed to be as little as three seconds.

On the African mainland it is usual for *pecuarius* to indulge in all manner of deliberately misleading behaviour the better to conceal the whereabouts of its nest, such as spoof nest-making, spoof brooding and false feeding, and even more disconcerting this is often done when there is no nest. Information is lacking as to whether *sanctae-helenae* resorts to these ruses, but according to Loveridge (*in litt.*) false feeding by a flushed brooder is very common. On the other hand distraction display by injury feigning on the part of *pecuarius*, does indicate the presence of eggs or young.

Occasionally one may come across a surprisingly confiding example of a brooding *pecuarius*, as described by Bevan and Chiazzari (1943) who "almost touched a singularly tame sitting bird."

In my own experience *pecuarius* at breeding time is inclined to group in a relatively small area—sometimes with nests not many yards apart, as is also recorded by Hall—even though there may be considerable expanses of suitable terrain available; but Haydock makes no mention of the proximity or otherwise of the nests of *sanctae-helenae.* Loveridge, however, informs me that none of the 19 nests with eggs he found were in close association, that is none was within 50 feet of another.

Voice: The calls of *sanctae-helenae* and *pecuarius* appear to be similar.

Enemies: Except members of the human race, *C. sanctae-helenae* seems to have few, if any, enemies, and according to Loveridge "Besides possible human predators, wirebirds are wise to conceal their eggs from the sharp eyes of the ubiquitous mynas who are forever sucking each other's eggs besides killing mice, geckos and frogs. Again, this island is periodically plagued by a burgeoning of rats—momentarily held in check by a poison-bait campaign." But Loveridge offers no evidence that such predation does in fact occur.

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together with his useful observations; and to C. J. O. Harrison of the Bird Room, British Museum (Natural History) for checking the egg measurements. Both these authorities, and also C. W. Benson, have kindly read through this paper prior to publication and I am grateful for their comments and advice.

SUMMARY

1. The claim that when St. Helena was discovered in 1502 the island was covered with forest is probably erroneous.
2. The possibility that *Gallinula chloropus*, the Moorhen, has long been a resident (though disappearing for a while) and that in the past, on the evidence of fossil remains, there were other indigenous species, in addition to *C.p. sanctae-helenae*, is mentioned.
3. The origin of the species *Charadrius pecuarius* is discussed.
4. *Charadrius pecuarius sanctae-helenae* or Wirebird, which must have originated from the African mainland, *c*. some 1,300 miles distant, is exclusive to the island of St. Helena.
5. *C.p. sanctae-helenae* is a larger bird than nominate *Charadrius pecuarius*, and its eggs, too, are larger.
6. There are plumage, down chick and egg differences in these two races.
7. Breeding behaviour and nesting habits of the two races are compared.
8. It is suggested that the eggs of the Wirebird may be subject to some predation.

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On some subspecies of the Common Blue Flycatcher *Niltava rufigastra* (Raffles)

by A. Hoogerwerf

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A fairly extensive series of this beautiful flycatcher obtained by me from the Sunda Strait area and on the Karimundjawa Islands made it possible to compare fresh material belonging to some different subspecies with each other and with old skins, partly discussed earlier by other authors.

Though there is individual variation in the extent of the light area on the lower under parts, the birds with the lightest abdominal region among the 68 ♀♂ present in Bogor Museum and studied by me, are found in the series from the Sunda Strait, especially among those of the Krakatau Islands with several skins showing a clear white abdomen. The resemblance to two birds from Sumatra and the Riouw Islands is very striking.

The difference mentioned in the diagnosis of the subspecies *rhizophorae* known from west Java and Sebesi Island (Sunda Strait)[9], *viz.* the brighter ("heller") blue of the upper surface and ferruginous colour of the breast when compared with *rufigastra*, cannot be confirmed by me when comparing all *rhizophorae* skins with only three birds of the nominate race before me. I fail to see any difference in the blue of the upper parts and in the brown below between both these forms among which a large series of *rhizophorae*, obtained from the Sunda Strait area which was included into the range of this subspecies by Chasen[2] and Chasen and Boden Kloss[5]. In their paper on the genus *Cyornis* (= *Niltava*) these authors mention six skins in the Bogor Museum from Sebesi Island which differ from birds of the nominate race in being very slightly lighter blue above and in his Handlist Chasen[3] wrote: "We have never seen topotypical *rhizophorae*, but the Sebesi birds are rather lighter blue above than most examples of *rufigastra* and we therefore refer them to the Javan form." But, as said above, I failed to see such differences between these subspecies in my material, which makes it probable that they are caused by comparing freshly obtained birds with old material.

Having only those three skins of the nominate race to compare with fresh and old *rhizophorae*, it is impossible for me to decide whether there is indeed enough reason to recognize this later subspecies and if it is correct to include birds from Krakatau and Sebesi Islands into the Javan race instead of uniting them with *rufigastra*. Therefore I have followed Chasen in including Strait Sunda into the range of *rhizophorae*. As I fail to see any difference between birds from Krakatau and Sebesi and those of neighbouring Sebuku and Legundi Islands, I also consider the specimens secured there belong to the Javan subspecies, together with a specimen from Meeuwen Island off Java's most western peninsula, classified also by Chasen as *rhizophorae*.

Besides variations in the plumage of the lower under parts there is some difference in the tint of the tawny colour on flanks, chest and throat, perhaps partly caused by long storage, and in the black on the chin of the males, which makes it impossible to discover any subspecific difference between *rufigastra*, *rhizophorae* and *longipennis*, so far as it concerns the material in my hands. This latter subspecies was described by Chasen and Boden Kloss[5] from the Karimundjawa Islands, principally on account of its larger wing size.

But old as well as freshly collected birds belonging to *karimatensis* from the Karimata Islands (West Borneo) are decidedly darker tawny below in both sexes and there is more black on the chin of the males, which seems enough to justify separation. There is also a considerable amount of variation on the upper surface, making it recommendable to examine a large series before it is justified to consider differences in the blue on those parts as to be of racial significance. Fresh material averages brighter blue than skins which have been stored a considerable time, and fresh skins are likely to be a trifle more vivid tawny below.

The differences in the bluish tint on the upper parts as stated in the diagnosis of *rhizophorae* when compared with the nominate race, leading to Chasen's classification of birds from Sebesi Island as *rhizophorae* could not be seen by me. And fresh as well as old material of our *longipennis* is not duller than *karimatensis* as is stated by Chasen and Boden Kloss[6] but brighter blue and also the differences in colour between *longipennis* and birds of the nominate form, as suggested by Chasen and Boden Kloss[5], could not be confirmed by me. I could not study enough material of *rufigastra* to give a definite conclusion.

Some variation is present in the colour of the sides of the head and in tint and extent of the clear blue above the eyes and on the forehead, which also makes it rather difficult to consider such differences of subspecific value. This perhaps also applies to the light area on the lores of the females which may differ in individuals from the same locality.

Besides the differences in plumage between *longipennis* and *karimatensis*, as indicated above, there is a rather important difference in wing size of birds of both sexes and individuals belonging to these subspecies differ much in size from *rufigastra* and *rhizophorae*, which also average shorter in the tail. The authors of *longipennis* did not mention this size difference when comparing this race with *karimatensis*, nor did they some years later[1] when discussing a collection of Karimata birds among which 9♂ and 5♀ of the latter subspecies, averaging considerably smaller in their wing measurements than *longipennis*. Also in my material size differences between both these subspecies are strikingly present as is borne out by the figures given below.

From our measurements it seems justified to suppose that there is only little individual variation in wing and tail length, for a difference of only 3 mm. in wing and 5 mm. in length of tail in 13 males of *longipennis* may be considered small. There is more variation in bill size, sometimes more than 2 mm. in birds of the same subspecies. From measurements taken by me on much more material than was at the disposal of Chasen and Boden Kloss when describing *longipennis*, it becomes evident that this subspecies not only averages larger in wing but also in tail compared with the other subspecies.

Finally I give some particulars of freshly collected material obtained on the Karimundjawa Archipelago (*longipennis*) and from the islands in and around the Sunda Strait (*rhizophorae*).

All males collected in October on Karimundjawa had heavily developed gonads (max. 8 and 11 mm.) and we found a rather similar situation in the material obtained in June in the Sunda Strait area (max. 7 and 8 mm.).

Also among the four males secured in May 1926 on the Karimundjawa Islands there were two with large testicles.

All females obtained in June and October in the Sunda Strait region and on the Karimundjawa Islands had very small ovaries, partly not even granular. In October we obtained a fledgling (♀) from the latter locality and there are also two juveniles (also ♀♀) among the small series of May 1926. All these females already had a blue tail. A very young male was collected on Krakatau Island in August. Therefore it seems justified to suppose that the breeding season covers many months.

We failed to find the species on Princes Island where *Niltava banyumas* was rather common, which proved to belong to a new subspecies (Hoogerwerf[8]). On the other islands in the Sunda Strait where we found *Niltava rufigastra*, we did not see *banyumas*. For particulars about the habitat of both these species, so far as it concerns Princes Island and Krakatau I may refer to an earlier paper (Hoogerwerf[7]).

Measurements (*in mm.*):

♂♂Wing: *rufigastra* (Sumatra): 72, 72, 73; *rhizophorae* (Sunda Strait and West Java): 67, 70, 72, 72, 72, 72, 73, 73, 73, 73, 73, 73, 73, 73, 73, 73, 74, 74, 75, 75; *longipennis* (Karimundjawa Islands): 79, 79, 80, 80, 80, 80, 80, 80, 80, 81, 82, 82, 82; *karimatensis* (Karimata Islands): 76, 77, 77, 77, 78, 78.

Tail: *rufigastra* (Sumatra): 56, 57, 59; *rhizophorae* (Sunda Strait and West Java): 54, 57, 58, 58, 58, 58, 59, 59, 59, 60, 60, 60, 60, 60, 61, 61, 61, 61, 61, 61; *longipennis* (Karimundjawa Islands): 63, 64, 64, 64, 65, 65, 65, 65, 66, 66, 67, 67, 68; *karimatensis* (Karimata Islands): 63, 63, 64, 64, 66, 67.

Culmen: *rufigastra* (Sumatra): 12.1, 12.2, 12.7; *rhizophorae* (Sunda Strait and West Java): 10.7, 11.1, 11.1, 11.6, 11.7, 11.8, 11.8, 11.8, 11.8, 11.9, 12, 12.1, 12.2, 12.2, 12.4, 12.5; *longipennis* (Karimundjawa Islands): 11.3, 11.8, 11.8, 11.9, 12.1, 12.6, 12.7, 12.9, 12.9, 13.3, 13.4; *karimatensis* (Karimata Islands): 11.5, 12.2, 12.5, 12.5, 12.6.

Max., min. and average measurements:

	rufigastra	*rhizophorae*	*longipennis*	*karimatensis*
Wing:	72–73	67–75	79–82	76–78
	72.33	72.65	80.38	77.17
Tail:	56–59	54–61	63–68	63–67
	57.33	59.30	65.31	64.50
Culmen:	12.1–12.7	10.7–12.5	11.3–13.4	11.5–12.6
	12.33	11.86	12.43	12.26

♀♀ Wing; *rufigastra:* none; *rhizophorae* (Sunda Strait and West Java): 67, 67, 68, 68, 69, 69, 70, 70, 70, 70, 70, 70, 71, 72; *longipennis* (Karimundjawa Islands): 74, 75, 75, 75, 76, 77, 77, 77, 78, 79; *karimatensis* (Karimata Islands): 70, 71, 74.

Tail: *rhizophorae* (Sunda Strait and West Java): 54, 54, 55, 56, 56, 57, 57, 57, 57, 58, 59, 59, 59; *longipennis* (Karimundjawa): 59, 60, 61, 61, 61, 61, 64, 65, 67, 68; *karimatensis* (Karimata Islands): 55, 57, 62.

Culmen: *rhizophorae* (Sunda Strait and West Java): 10, 10.9, 11, 11, 11.1, 11.3, 11.5, 11.9, 12.1, 12.2, 12.2, 12.6; *longipennis* (Karimundjawa): 11.8, 12.1, 12.2, 12.4, 12.6, 12.6 *karimatensis* (Karimata Islands): 11, 11.8, 11.9.

Max., min. and average measurements:

	rhizophorae	*longipennis*	*karimatensis*
Wing:	67–72	74–79	70–74
	69.36	76.30	71.67
Tail:	54–59	59–68	55–62
	56.77	62.70	58
Culmen:	10–12.6	11.8–12.6	11–11.9
	11.48	12.28	11.57

Some measurements compiled from literature:

Chasen and Boden Kloss: [5] and [6]

longipennis, ♂♂ Wing: 78, 79, 80, 82 (av. 79.75)
♀♀ Wing: 74, 75, 75, 76.5, 77, 79 (av. 76.08)
rufigastra, ♂♂ Wing: 71–77; ♀♀ 68–73.

Boden Kloss and Chasen:[1]

karimatensis, ♂♂ Wing: 74, 75, 76.5, 77, 77, 77, 77.5, 78, 78 (av. 76.67)
♀♀ Wing: 71, 71, 72.5, 74, 74 (av. 72.50)

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[1] Boden Kloss, C. and Chasen, F. N. On a small collection of Birds from the Karimata Islands, West Borneo, *Treubia*, 14, 1932/34, p. 161.

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[3] — A Handlist of Malaysian Birds: *Bulletin Raffles Museum*, Singapore; Vol. 11, 1935, p. 166 (footnote).

[4] Chasen, F. N. and Boden Kloss, C. On some Birds of the Genus *Cyornis; Bull. Raffles Museum*, Singapore, no. 2, 1929, p. 34–39.

[5] — A new race of *Cyornis* from the Java Sea, *Treubia*, 12, 1930, p. 271.

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[7] Hoogerwerf, A. Notes on the vertebrate fauna of the Krakatau Islands; *Treubia*, 22, 1953, p. 334/5.

[8] — Some ornithological notes on the Smaller Islands around Java (with the description of seven new subspecies); *Ardea*, 50, 1962, p. 190/92.

[9] Stresemann, Erw. Uber einige *Cyornis* Arten; *Orn. Monats Berichte*, 33, 1925, p. 50.

On a nest of the Yellow-billed Oxpecker *Buphagus africanus* in Zambia

by R. J. Dowsett

Received 5th March, 1965

Benson, Brooke and Vernon (1964) give no breeding record of either the Yellow-billed Oxpecker *Buphagus africanus* (Linn.) or the Red-billed Oxpecker *Buphagus erythrorhynchus* (Stanley) from Zambia or

Malawi, and only one of each species from Rhodesia. In view of this paucity of data it is worthwhile discussing in some detail the first nest of *B. africanus* to be found in Zambia.

I found the nest near Ngoma camp in the Kafue National Park (15.54′ S, 25.58′ E) in the late afternoon of 4th January 1965. The nest hole was 15 feet up in a *Pseudolachnostylis maprouneifolia* (Pax) tree and faced south. The nest contained three young just about to fledge, which were being fed by a group of four adults. The nest chamber was 13 inches deep; the young were fed at the mouth of it, and as soon as the adults flew away they dropped down inside. The young and adults were very noisy during feeding, but while the adults were away the young remained quiet.

When the nest was examined closely two of the young flew from it, one strongly and out of sight, the other weakly to the ground. This latter was collected as a specimen, which is now in the Rhodes-Livingstone Museum, Livingstone, Zambia. It was not fully grown, and measured: wing 97.5, bill (to skull) 20.0, tarsus 24.0 and tail 47.0 mm. Contrary to the description given by McLachlan and Liversidge (1957) and by Mackworth-Praed and Grant (1963) this specimen, and the other two young seen, had not a "dusky" coloured bill, but a yellow one, pale at the tip and shading to lemon at the gape. When the specimen was re-examined six weeks after being preserved the bill had faded to a dull buff, with little trace of yellow. The iris was a uniform dark brown. The tarsus and toes were light blue-grey with off-white soles, compared with the black tarsus of an adult in breeding dress examined in the collection of the Rhodes-Livingstone Museum.

Comparison of the fledgling collected, with the skin of an adult in the Rhodes-Livingstone Museum, possible through the kind assistance of C. W. Benson, reveals several plumage differences not mentioned by either McLachlan and Liversidge (1957) or Mackworth-Praed and Grant (1963). In the juvenile, the feathers of the forehead, crown, nape, scapulars, mantle, back, rump and upper tail-coverts are all finely barred with black; there is no sign of any such shadow barring on the adult. Similarly the juvenile throat and upper breast feathers are finely barred. The rump of the juvenile is buffy, less bright yellow than that of the adult. The under parts of the juvenile are more orange than the rather yellow under parts of the adult. The head and back of the adult have an olive tint absent from the juvenile.

In the field, juvenile *B. africanus* could probably be distinguished from adults of that species by the very short tail. There should be no confusion with young of *B. erythrorhynchus*, as these young *B. africanus* already had the prominent pale rump typical of the adult.

At my request B. L. Mitchell, Biologist of the Kafue National Park, examined the stomach contents of the specimen collected. He reports that there was a considerable amount of hair, apparently of Buffalo (*Syncerus caffer* Sparrman), an unidentified seed and what seemed to be the legs of a beetle. No ticks were found. When the contents were placed in formalin a smoky solution was produced, probably indicative of the presence of blood in the stomach. The stomach contents of seven *B. africanus* (presumably adult) examined by van Someren (1951) contained a number of ticks and a good deal of hair.

It is interesting that these oxpeckers should be breeding in the rains in Zambia, when animals are considerably dispersed and hosts difficult to see in thick vegetation. It is known that within an area of four square miles around the nest the only potential hosts at this time were 20 Buffalo, about 9 Kudu (*Tragelaphus strepsiceros* Pallas) and a few Wart Hog (*Phacochoerus aethiopicus* Pallas) (personal observation). However, I noted *B. africanus* on only the first two of these species. Other ungulates in the area seldom, if ever, carried oxpeckers. It would seem that these nesting *B. africanus* were feeding solely on these few Buffalo and Kudu, both of which are species inhabiting thickets in which they are not readily visible. I noted that these Buffalo were supporting at least 20 *B. africanus* at this time. The feeding of the young by four adults might be in order to provide a sufficient supply of food at a difficult time of year. Oxpeckers may have good eyesight, but even so, considerably more difficulty must be experienced in finding hosts during the rains than in the dry season.

B. africanus is quite common in game areas in Zambia, being especially numerous in the Kafue National Park. The lack of breeding records is therefore surprising, especially as the feeding of young at the nest appears to be a noisy affair, noticeable at a considerable distance.

I should like to thank B. L. Mitchell for examining the stomach contents referred to in this paper; he and C. W. Benson read the draft of this paper.

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Winter dress of *Cisticola chiniana bensoni*

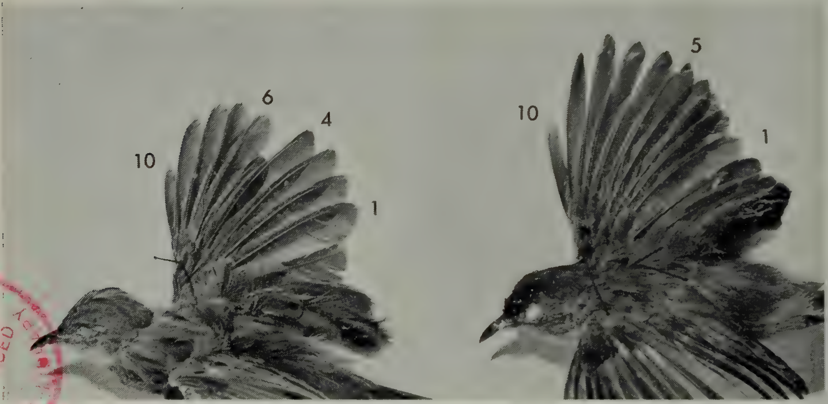
by M. A. TRAYLOR

Received 29th March, 1965

Through the very great kindness of C. W. Benson, I have now been able to examine two winter specimens of *Cisticola chiniana bensoni* Traylor (1964, B.B.O.C., 84: 83), previously known only from summer dress males. One of these is a first winter male, taken 25 April 1964 at Kalabo, Barotseland, the other an adult female, taken on the north edge of Liuwa plain, 14° 15′ S, 22° 15′ E, on 2 May, 1964. Both were collected by R. C. Hart.

The female is in fine fresh contour plumage and completing wing moult, the first to sixth primaries are fresh, the seventh growing, and the eighth to tenth old and worn. The tail is mixed, with the central rectrices still of the old summer plumage. The winter plumage turns out to be surprisingly close to the summer, being almost as dark and a warmer, less greyish, brown on the upper parts. The crown is a little more reddish, and the dorsal streaking slightly more pronounced. This is in marked contrast to the situation in *smithersi*, the nearest relative to the south. In *smithersi* the winter plumage is much paler and more tawny than the summer, the crown is much brighter, and the dorsal streaking strongly marked. It follows that the racial characters of *bensoni* are better marked in the winter than in the summer plumage, *bensoni* being much darker and more greyish-brown.

The young male is in complete first winter contour plumage, and has begun replacement of the juvenal remiges. The first through fourth are fresh, the fifth half-grown, and the remainder old juvenal feathers. Assurance that this bird is a first winter male and not an adult in post-nuptial moult is given by the marked difference in length between the juvenal and second set of primaries (see fig.). The contour of the wing of the first winter bird (left) shows a marked step between the old and the new feathers, while the contour of the wing of the fully adult bird is smooth. This replacement of the wing feathers is a peculiar moult, falling as it does between the post-juvenal and first pre-nuptial moults of the contour feathers. Lynes (1930, Cisticola Suppl.: pl. 1) links it with the first pre-nuptial moult, but notes that the moult of the remiges begins some time before the moult of the contour plumage.



Cisticola chiniana bensoni. First winter ♂ in wing moult (left); adult male (right).

This first winter plumaged male is quite unlike the adult female. It is hardly to be separated from winter plumaged *smithersi*, being quite pale and tawny and heavily streaked above. Whether this is the rule for first winter birds of *bensoni* cannot be determined from a single specimen. Lynes (*l.c.*) says that the first winter plumage is the same in colour and pattern as adult winter plumage, but that is certainly not the case with our two birds. Only adequate series will permit this anomaly to be clarified.

Larger size was also a character of *bensoni*. The young male does not give a satisfactory measurement because of its moult from juvenal primaries. The female has a wing length of 55 mm., about the mean of the measurements of seven females of *smithersi*, 53-57 (55.4). Size difference in females is obviously not great if it exists at all.

The range of *bensoni* can now be outlined more surely. The type locality is on the eastern edge of Liuwa plain, and the race evidently inhabits the woodlands bordering the plain between the Luanginga and the Luambimba rivers.

CONTRIBUTORS

Contributions are not restricted to members of the B.O.C. and should be addressed to the Editor, Mr. John Yealland, The Zoological Society of London, Regent's Park, London, N.W.1. These should be concise and typed on one side of the paper, double-spaced, with a good margin. The first time a species is mentioned, the scientific generic and specific names should be included. Subsequently the same name need only have the initial letter of the genus. Scientific names are printed in italics and should be underlined in the typescript. References should be given at the end of the paper.

Authors introducing a new name or describing a new species or race should indicate this in their title and display the name prominently in the text followed by *nom. nov.*, *sp. nov.*, *subsp. nov.* as appropriate. In these descriptions, the first introduction of the name should be followed by paragraphs for "Description", "Distribution", "Type", "Measurements of Type", "Material examined" and further sub-headings as required.

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DINNERS AND MEETINGS FOR 1965

19th October, 16th November and 21st December.

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The six hundred and twenty-eighth meeting of the Club was held at the British Museum (Natural History) on the 19th October, 1965 in conjunction with the British Ornithologists' Union.

The Special General Meeting

Since fewer than the required 50 members were present, the proposals concerning changes in the Club rules could not be decided upon.

The races of the Pompadour Green Pigeon, *Treron pompadora*, in the Philippine Islands

by KENNETH C. PARKES

Received 3rd August, 1965

The Pompadour Green Pigeon, *Treron pompadora*, is a highly polytypic species inhabiting southern Asia from India east to Timor. It is a common and widely distributed member of the avifauna of the Philippine Islands. Current literature assigns all Philippine populations to the subspecies *axillaris* (Bonaparte), excepting those from the Sulu Archipelago, which are *everetti* (Rothschild). Bonaparte gave no locality for *axillaris*, but Hachisuka (*The birds of the Philippine Islands*, vol. 1, part 2, 1932: 173) gives the restricted type locality as "southern Luzon". Examination of nearly 200 Philippine specimens of this species indicates the present taxonomic treatment to be an oversimplification. The geographic variation within the Philippines can better be reflected by restricting the name *axillaris* to the populations of southern Luzon, Mindoro, and Polillo, and describing two new subspecies. The first of these may be known as:

Treron pompadora canescens, subsp. nov.

Type: American Museum of Natural History no. 459771, adult ♂, collected at Santa Catalina, Inubongan, Negros Island, Philippines, 21st December, 1953, by D. S. Rabor (collector's no. 5755).

Characters: males differ from *axillaris* of southern Luzon as follows: maroon area of dorsum darker, with a glaucous wash; a rather distinct pale grey band (lacking or rudimentary in *axillaris*) between the maroon area and the green of the fore-back; the latter area washed with greyish; grey of crown averaging purer and more extensive; green of underparts averaging somewhat less yellowish; axillary region more purely grey, less mixed with greenish; centre of abdomen usually with greyish wash. Males differ from *everetti* of the Sulus as follows: underparts less intensely yellow green; dorsum darker, less purplish; grey band between maroon and green areas of back averaging less clearly defined. Females differ from *axillaris* less distinctly; the axillary region as in males; grey cap clearer, more distinct; generally with more grey on abdomen and a greyish wash on the fore-back. Females differ from *everetti* in having less contrast between the pale green of the nape and fore-back and the dark green of the mantle.

Range: central and southern islands of the Philippine archipelago, except for the Sulu islands; see list of specimens examined. One male from Leyte approaches *axillaris* in back colour, but two females from Leyte and a series of twelve specimens from adjacent Samar indicate that the populations of these islands should be assigned to *canescens*. Males from Polillo are somewhat less yellow below, with more grey on the abdomen, than most *axillaris*, but are best assigned to that subspecies.

Treron pompadora amadoni, subsp. nov.

Type: American Museum of Natural History no. 767586, adult ♂, collected at Barrio Disulap, San Mariano, Isabela Province, northern Luzon Island, Philippines, 5th May, 1961, by G. Alcasid, M. Celestino, T. Oane, and J. Ramos (collectors' no. 327).

Characters: resembles the geographically distant *canescens* much more closely than the adjacent *axillaris:* males differ from *canescens* in having the grey areas at front of maroon mantle and on crown averaging darker and less clearly defined, and in lacking a dark grey band at the posterior margin of the maroon mantle. Females average darker on the back than *axillaris*, but more uniform than *canescens*, with little or no grey wash on the fore-back; underparts average greyer, less yellowish green than either *axillaris* or *canescens;* nearer the former in having the cap less purely grey and less clearly defined.

Range: northern Luzon Island, Philippines (see list of specimens examined for provinces). The southernmost specimens of *amadoni* examined are from southern Mountain Province; the northernmost of *axillaris* are from east-central Nueva Ecija Province.

This subspecies is named for Dr. Dean Amadon of the American Museum of Natural History in recognition of his many kindnesses in placing the facilities of his institution at my disposal during my studies of Philippine birds.

Specimens examined: T. p. axillaris—LUZON (by province) Bataan, 8; Camarines, 3; Nueva Ecija, 8; Rizal, 3; Sorsogon, 14; MINDORO, 2; POLILLO, 10. *T. p. canescens*—BASILAN, 4; BOHOL, 4; LEYTE 3; MINDANAO, 25; NEGROS, 22; PANAY, 1; SAMAR, 12; SIQUIJOR, 5. *T. p. amadoni*—LUZON (by province) Abra, 1; Cagayan, 38; Ilocos Norte, 4; Isabela, 15; "Northern Luzon" unspecified, 4 (=Whitehead's specimens from Benguet subprovince, Mountain Province). *T. p. everetti* —BONGAO, 1 (the type); MAIMBUN, 1; SIBUTU, 2; SULU, 1.

ACKNOWLEDGMENTS

My own institution, Carnegie Museum, possess only eight specimens of *Treron pompadora.* Therefore most of the study reported on here was conducted at the American Museum of Natural History through the

courtesy of Dr. Amadon, supported in part by a travel grant from the Chapman Memorial Fund. Specimens were also studied at the Chicago Natural History Museum, Peabody Museum of Natural History at Yale University, United States National Museum, and Academy of Natural Sciences of Philadelphia, with the kind co-operation of the authorities of those institutions.

On the breeding of *Lamprotornis mevesii* (Wahlberg)

by R. K. Brooke

Received 24th May, 1965

The only original observations on the breeding of *Lamprotornis mevesii* are contained in Benson (1944 and 1953) and Jubb (1952). From these we learn that it nests during the rains in holes in trees (Acacias, Baobabs, Mopane and Palms) and that the one egg collected is plain pale blue and measures 28.5 x 20 mm. A number of breeding records, mostly from Rhodesia, are now available which round out this rather scanty picture (see Table).

Records 11, 12 and 13 were in adjacent trees. It would appear that Jubb's (1952) record of three nests in one tree is not normal behaviour but, rather, symptomatic of the opportunist tendencies of starlings. They seem indifferent whether the hole is in live or dead wood or whether the entrance is underneath a branch or on the side of a trunk.

Dr. C. R. Saunders has written to me about record no. 16 which is now in his collection and has made some interesting points in connection with the species which I now quote. "Nest lined with a few leaves and bits of dead fibre. Eggs a rather washed out greeny-blue and not at all like those of *L. chloropterus* and *L. chalybaeus* which are a far deeper and richer blue. Immaculate but heavily nest-stained. Moderately incubated.

"It seems to be resident throughout the year at Chiredzi. At Dennis Townley's on the Devure River small parties are fed at his front window on fruit and they definitely move out at the commencement of the rains when the flocks break up into pairs and do not return to his garden until early winter. They migrate to breed a few miles away.

"A pair has bred for the last two years in a black thorn tree opposite my driveway (at Chiredzi). This nest is in a broken off branch hollow about 20 feet from the ground. They produced two young last year and again this year breeding in February and exhibiting their young on our lawn in late March. For about three weeks after leaving the nest the young are conspicuous by their short tails. A pair nested in January 1964 in a broken off branch of a thorn tree on the banks of the Chiredzi River. This nest was inaccessible, but like the others I have seen was certainly neither in a colony nor on the under side of the branch.

"They sleep in a thickly foliaged tree right outside my bedroom and though they are active and noisy at roosting time they could hardly be called acrobatic. They frequently wake up at night and 'churr' away shrilly."

The table supports Saunders' comments on *L. mevesii* being a rainy season breeder. Praed and Grant (1963) write "Recorded breeding: Northern Rhodesia, October and November. Nyasaland, October to February. Southern Rhodesia, December to February. The references to October and November are apparently based on Priest's (1936) honest

TABLE—Breeding records of *Lamprotornis mevesii*

	Date	Place	Recorder	Clutch	Egg size	Nest site	Source
1.	22. 4.06	Mossamedes, Angola	W. J. Ansorge	3y			Am. Mus. Nat. Hist.
2.	3. 2.43	Fort Johnston, Malawi	C. W. Benson	1	28.5 x 20	*Adansonia digitata*	Benson, 1944
3.	15.12. ?	Ntaktataka, Malawi	C. W. Benson	bldg.		*Hyphaene*	Benson, 1953
4.	7. 3. ?	Ntaktataka, Malawi	C. W. Benson	yy		*Colophospermum mopane*	Benson, 1953
5.	22. 1.51	Sabi Valley, Rhodesia	R. A. Jubb	yy		*Acacia* sp. *tortilus* ?	Jubb, 1952
6.	22. 1.51	Sabi Valley, Rhodesia	R. A. Jubb	yy		*Acacia* sp. *tortilus* ?	Jubb, 1952
7.	22. 1.51	Sabi Valley, Rhodesia	R. A. Jubb	yy		*Acacia* sp. *tortilus* ?	Jubb, 1952
8.	21. 2.53	Nuanetsi, Rhodesia	A. D. Gosling	4	25–24 x 20–19.5	*Acacia* woodpecker's hole	Rho. Ornith. Society
9.	15. 2.61	Lochinvar, Zambia	C. W. Benson	yolking oocyte 8 x 7			Benson, pers. comm.
10.	13. 3.61	Kariba, Rhodesia	G. F. T. Child	3		*C. mopane* 1.5 ft. from ground	Rho. Ornith. Society
11.	22. 1.64	Sabi Valley, Rhodesia	K. E. Cackett	2y		*Combretum imberbe* natural hole	Rho. Ornith. Society
12.	22. 1.64	Sabi Valley, Rhodesia	K. E. Cackett	yy		*Combretum imberbe* natural hole	Rho. Ornith. Society
13.	22. 1.64	Sabi Valley, Rhodesia	K. E. Cackett	yy		*Combretum imberbe* natural hole	Rho. Ornith. Society
14.	24. 1.64	Sabi Valley, Rhodesia	K. E. Cackett	3	3 x 30 x 20	dead tree natural hole	Rho. Ornith. Soicety
15.	30. 1.64	Bubye River, Rhodesia	K. E. Cackett	yy		*Combretum* sp. natural hole	Rho. Ornith. Society
16.	24. 2.64	Chiredzi, Rhodesia	A. Savory and C. R. Saunders	3	26.2 x 19 25.8 x 18.6 25 x 18.2	dead *C. mopane* natural hole	Rho. Ornith. Society
17.	? 3.64	Sabi Valley, Rhodesia	K. E. Cackett	yy		ventilation shaft	Cackett pers. comm.

Breeding season: Dec. 4, Jan. 5, Feb. 8, March 2.

comment "I have never found a nest as I have not been in the locality when, I expect, they breed in October and November."

No nests have yet been recorded from Zambia but C. W. Benson (*in litt.*) shot a ♀ at Lochinvar on 15th February, 1961 which contained a yolking oocyte (record no. 9). I am also indebted to Mr. Benson for telling me of record no. 1.

The species inhabits chiefly dry deciduous woodlands dominated by *Colophospermum mopane* and by *Acacia* spp. However, it is not uniformly distributed. It is hardly ever found except on flat ground. K. E. Cackett of the Ministry of Agriculture tells me that in south-eastern Rhodesia he has only found it on alluvial soils and makes a number of other interesting points.

His record no. 14 was of eggs taken from a hole formed by a branch breaking away and containing a cup of grass with no feathers at all. Brooding parents were observed to back into their nest holes presumably because their long tails cannot be managed in any other way. He found that the species showed little sign of territorial behaviour or tendency to separate into obvious pairs but that on two occasions in September, when they were not breeding, they objected strongly to the Lilac-breasted Roller *Coracias caudatus* prospecting holes for possible nest sites. When inspecting nest no. 11 all the available *L. mevesii* joined in mobbing him.

To recapitulate, *L. mevesii* lays up to four faded plain blue eggs averaging 27.2 x 19.5 mm. in natural or artificial holes during the wet months December to March. The nest is a cup of dead vegetable matter without feathers.

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A pair of wild-shot Mallard x Gadwall from the Solway

by JAMES M. and JEFFERY G. HARRISON

Received 22nd February, 1965

In February, 1907, a pair of hybrid duck was shot at Skinburyness, Solway Firth, Cumberland by William Nichol, a noted wildfowler-naturalist.

The history is that this pair of birds had been observed by the shooter several times and he had identified them as hybrids between the Mallard, *Anas platyrhynchos platyrhynchos* Linnaeus and the Gadwall, *Anas strepera* Linnaeus, an observation of considerable acumen. Both birds in the field would attract the attention of a keen and knowledgeable wildfowler, whose first impression would be that they were Gadwall, for overall both resemble that species very closely.

With any less acute observer that is probably as far as a field identification would have gone, but Mr. Nichol had recognised that they were sufficiently different from Gadwall to merit further attention, so he collected both and in due course they found their way into the Carlisle Museum collection.

This pair presents an instance in which the hybrid progeny of an interspecific cross show a broadly intermediate state between the two parent species, but as there are some features which do not closely relate to either species, a detailed description of each specimen is appended:

♂ adult.

Upper parts:

Back adjacent to neck: similar to drake Gadwall, but somewhat browner, vermiculated sepia and off white.

Mantle: similar.

Lower back: sepia, obscurely vermiculated greyish-white.

Rump: the rump and upper tail-coverts are bluish-black, though one or two of the latter are vermiculated sepia with greyish-white.

Rectrices: central pair pale brownish-sepia; the rest paler with the best part of the medial vanes whitish, vermiculated with very pale brownish-sepia; tips and outer edges whitish. In some of the outermost rectrices on both sides the outer edges to the tips are Clay-coloured (Ridgway, V., 8).

Wing: lesser and median wing-coverts are much as in drake Gadwall, but tips tinged rather more with dull rufous. Greater coverts, on the other hand show much less rufous and the broad blackish tips are not so rich. Anterior part of the speculum is of similar blackness, but shows some greenish-bronze reflection. The posterior part of the speculum is Drab Grey (Ridgway, II, 13), the lower edges bordered dusky-sepia.

Flight feathers: outer vanes and tips sepia, rest paler sepia, tinged clay-colour.

Scapulars: these are very similar to Gadwall, but rather browner and edges of median length scapulars appreciably paler. Longest uniform as in Gadwall, but browner.

Flanks: as in drake Gadwall, but tinged with brown.

Under parts:

Breast-shield: brown, but not as deep as in drake Mallard. Number of Gadwall crescents reduced and many vestigial and reduced to paired ovoid sepia spots on lower edges of breast feathers. It should be noted that these are extended on either side down on to the upper half of the flanks.

Belly: white, lower half faintly vermiculated pale greyish extending to beyond the vent.

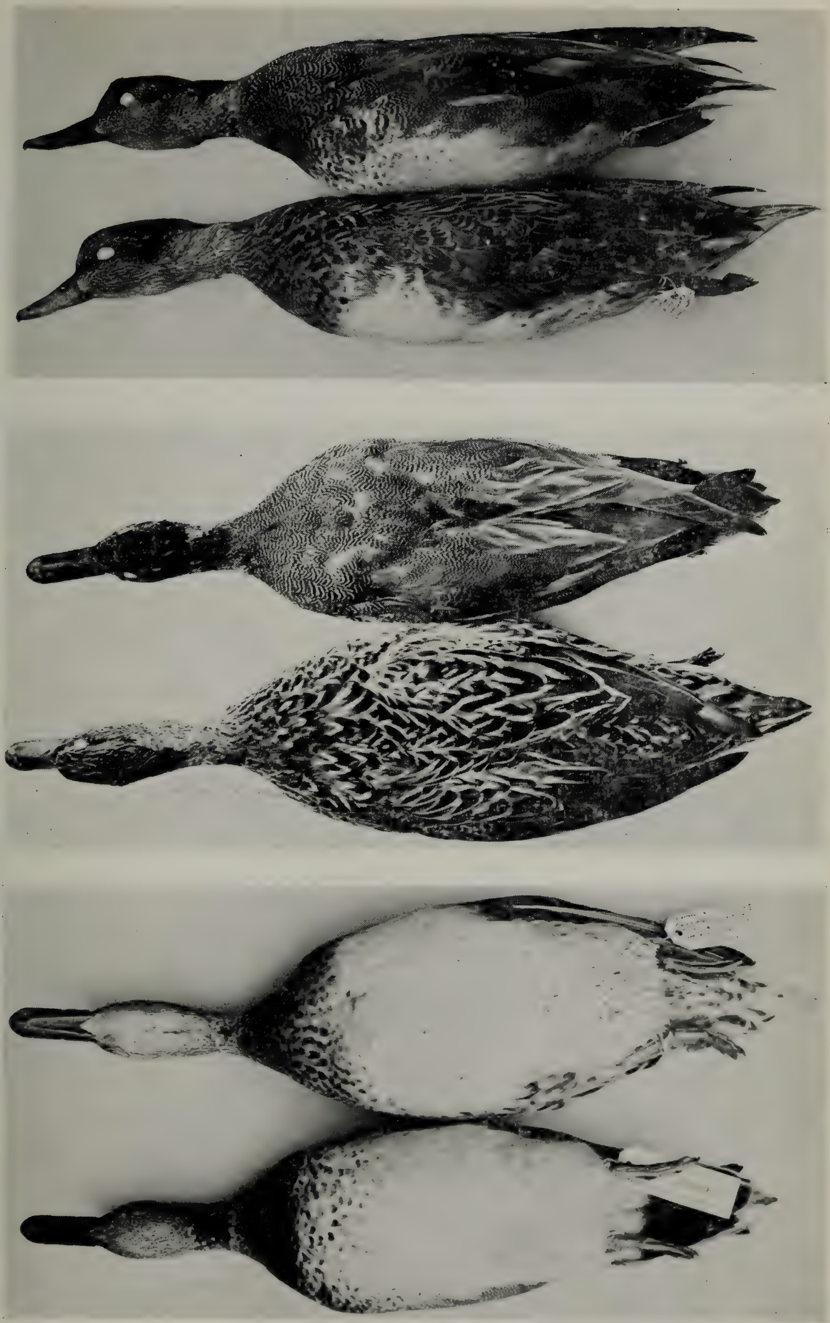
Under tail-coverts: blackish, a few brownish, vermiculated paler brownish-white.

Rectrices: pale greyish-sepia, showing pattern of upper surface faintly.

Wing: under surface, axillaries right side white, left side some white, some *black;* under wing-coverts, etc. white.

Flight feathers: greyish-sepia.

Head and neck: crown rather darker than in Gadwall, dully reflecting bronze. Post-ocular stripe of same colour. Rest of head and neck Isabella Colour (Ridgway III, 23), paler on throat, and finely striated sepia. At the root of the neck there is a pale clay-coloured semi-neck ring, and above this a roughly triangular patch of blackish-bronze, measuring 30 mm. x 25 mm. with the apex directed upwards. The significance of this curious character is discussed below. Bill appears to have been blackish with yellowish tip and sepia nail. Legs and toes yellowish.



Mallard x Gadwall hybrids.

♀ adult.

Upper parts: the whole of the upper parts of both parent species are very similar within the normal range of individual variation and the hybrid shows no significant differences.

Wing: lesser and median wing-coverts closely similar to those of duck Gadwall. Greater wing-coverts: proximal two thirds palest sepia with chestnut wash, distal third matt black forming a broad bar. Speculum: proximal half iridescent green, distal part matt black, bordered narrowly greyish-white. The normal white in the speculum of the duck Gadwall is in the hybrid dull french grey.

Flight feathers and scapulars: closely similar in the hybrid and both parent species.

Flanks: as in duck Gadwall.

Under parts: resemble duck Gadwall.

Wing: under surface, axillaries right side white, left side some white, some *black*. Under wing-coverts, etc. white.

Head and neck: very similar to duck Gadwall, except that the chin and throat are less spotted. Bill, legs and toes appear to have been yellowish in life as in duck Gadwall.

	Mallard		Hybrid		Gadwall	
Measurements in mm.:	♂	♀	♂	♀	♂	♀
Wing:	265	235	264	261	255	246
Bill:						
Length	55	47	40	46	45	43
Width at nostrils	22.5	21	18	20	17	15
Tarsus:	46	41	39	38	43.5	35
Tail:	86	76	83	90	87	94

DISCUSSION

The drake is an intermediate type hybrid and on general characters is nearer Gadwall than Mallard. The upper parts however, are generally rather browner and the crown somewhat darker than in the Gadwall.

The dark speculum in the hybrid reflects greenish-bronze, but lacks the violet and the white edges of the Mallard. The conspicuous white posterior part of the Gadwall's speculum is grey in the hybrid. Below, the breast-shield is considerably browner and tends to be more spotted on its lower border than in a Gadwall with its typical crescents.

The most striking character, however, is the triangular blackish-bronze marking on the neck anteriorly, immediately above the pale chestnut semi-ring. This feature was noted in precisely the same location in the Mallard x Pintail x Gadwall trigen (Harrison, J. M. and J. G. *antea* 1965). The significance of this character is by no means clear, but would appear to be derived from the Mallard, as it was present in the trigen referred to above.

The pale chestnut semi-neck ring has been recorded by us not infrequently as a variant character as seen in drake Gadwall. (Harrison, J. M. and J. G. *antea* 1963). The duck could well be mistaken for a duck Gadwall, except for the changes seen in the speculum. These show the anterior part of the speculum black, strongly reflecting green, but lacking white edges. The posterior white part of the speculum has, as in the drake, become grey. The greater wing-coverts are broadly tipped sooty black as in the Gadwall. A further inexplicable feature in both hybrids is the presence of a few completely black axillaries on the left side only. The inference of this is that both birds are from the same brood, which would be highly likely.

SUMMARY

This paper describes a pair of wild Mallard x Gadwall hybrids. In almost all characters the birds demonstrate the principle that in some hybrids the characters are intermediate, with the exception of the curious blackish neck marking shown by the drake, and the presence of unilateral black axillaries in both hybrids.

ACKNOWLEDGMENTS

We are very grateful to Mr. Ernest Blezard, Keeper of Zoology at the Carlisle Museum for the loan of the two hybrids and to his assistant, Allan Allison, who so skilfully reduced the two specimens to skins from their original mounted state. We are also much indebted to Dr. Pamela Harrison for the photographs illustrating this paper.

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Harrison, J. M. and J. G. (1963). A Gadwall with a white neck ring and a review of plumage variants in wildfowl. *Bull. B.O.C.*, 83 : 101–108.

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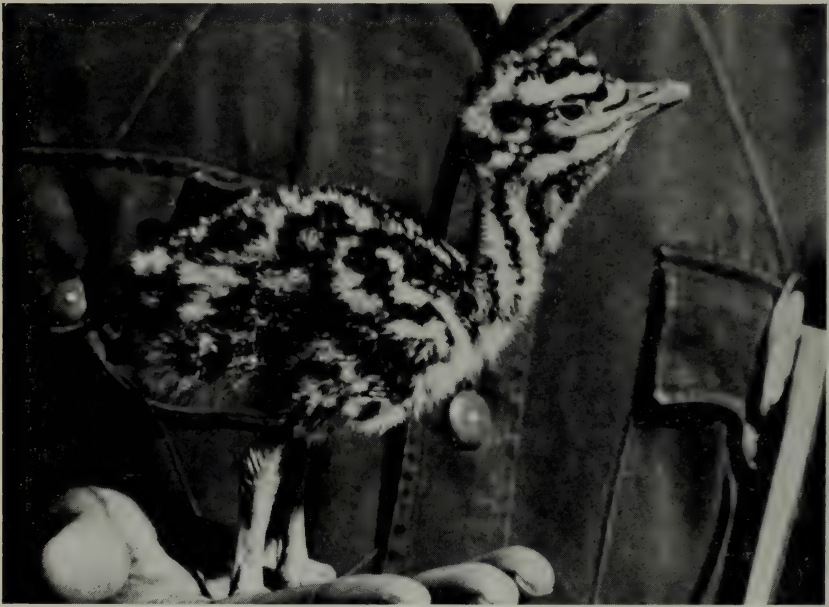
On the Kori Bustard, *Ardeotis kori* (Burchell) in north-western Tanzania

by A. M. Morgan-Davies

Received 23rd July, 1965

In the Serengeti National Park, where much of these observations were made, the Kori Bustard is a common species of the open plains between Seronera and the Ngorongoro Crater Highlands. The breeding season commences approximately with the onset of the long rains about February and continues till about early May, by which time most eggs will have hatched. On the 12th May 1965, I found two young that were probably not more than five days of age. The suspicious behaviour of the female, by walking in a crouched attitude, assured me she must have either eggs or young near at hand. We searched the area for twenty minutes with no success but noting the while the parent bird had made an almost complete half circle about us at fifty yards distance. This characteristic behaviour reassured us that she must have eggs, or more probably young. As continued search proved useless we decided to remain still in the hope of picking up the call of the chicks that we now felt certain there must be as there was no sign of eggs. Within five minutes we heard the faint but unmistakable call of a young bird close at hand and by slowly moving up after each successive call we came upon two downy chicks, whose cryptic coloration was so good it was only possible to see them at a distance of a few feet. Although the long rains had been over for but a few weeks, the countryside was already drying and the speckled tawny and black colouring of the chicks blended in well with the drying grass and black-cotton soil.

Mackworth-Praed and Grant (1957) have noted as being unrecorded, the nestling plumage of the Kori Bustard and the description given here will now fill this gap. Above, tawny; head with a dark brown stripe from the eye to the upper forehead and from the upper forehead backwards towards the nape; crown mottled dark brown; neck with brown vertical stripes and a distinct dark throat patch extending down the front of the neck; upper parts heavily mottled with dark brown and black; below dull white mottled with brown on flanks; feet pinkish; bill pale grey; eyes brown. The distended throat is most noticeable. The chicks appeared not to feed from the ground but from head-height and I suspect at this early age their diet is predominantly insectile and much of their food is obtained by the parent bird.



Even at the age of a few days its precocious nature, behaviour and character are remarkably like the parent birds. It showed little sign of fear and stood in the palm of the hand with the haughty and aloof deportment so characteristic of an adult. Although I have only heard of one instance of the parent bird using threat postures and "growling", this behaviour does not appear to be common and the parent bird usually keeps a respectful distance from humans.

The remarkably few breeding records of the Kori Bustard are probably due to three reasons. The apparent preference of the species to lay on open grass-covered plains that, during this period of the year, are a sea of up to two to three feet high grass; the excellent coloration of the parent bird, of the eggs and of the young; and the incubating or attending parent bird's habit of immediately leaving its eggs or young at the slightest sign of danger or, alternatively, relying on its coloration and pressing itself as close as possible to the ground if taken by surprise at a close distance. There are two periods of the year when Kori Bustards congregate in large numbers at a source of food. The first of these is most noticeable in the Serengeti National Park when the migration of thousands of wildebeest concentrate on the open eastern plains. The herds of moving wildebeest cause a constant scattering in all directions of insects, small rodents and lizards that are soon seized by the numerous attendant bustards that follow alongside the flanks of the migrating herds. Another source of food is provided by the numerous bush and grass fires so characteristic of East Africa. In this instance, accompanied by Marabou Storks, they either walk about the warm ashes in the lee of the advancing flames, picking out charred insects, or even keep a few feet ahead of the advancing flames gathering insects and other small creatures fleeing from the blaze. Although the Kori Bustard is a reluctant flyer it appears to travel many miles at this time of the year from one grass fire to another.

On *Rhipidura javanica* Sparrman in the Sunda Strait area

by A. Hoogerwerf

Received 20th January, 1964

A rather remarkable, though small, series of Fantail Flycatcher from the Sunda Strait formed the main reason for writing these notes from which it once more becomes evident how interesting this area between Java and Sumatra is.

When describing *Rhipidura longicauda* Alfred R. Wallace[5] mentions as differences from *Rhipidura javanica*, besides the long tail "narrow white tips to only three outer tailfeathers, and the black chin". But in the series (partly fresh) of both these subspecies studied by me, these characters are not very convincing though it cannot be denied that *longicauda* averages in having more often black on the chin than *javanica* and that none of this last race in my series has so much black on that area as have several *longicauda*. Of the white on the tail there is so much variation that this character cannot be accepted as of racial importance.

Perhaps those differences in the plumage are not recognized as of subspecific value by later authors, for Chasen and Kloss[2] are of the opinion that the two forms are not well defined but that birds from Borneo and Sumatra seem rather larger and, on a series, are generally duller on the upper parts, less reddish-brown on the rump and upper tail-coverts and less washed with brownish on the belly.

Later Boden Kloss[3], speaking of *javanica*, writes "it is a little more tinged with ferruginous above and below than *longicauda*". Mayr[4] writes about some Bornean birds classified by him as *longicauda* "these small birds might also be referred to typical *javanica*", from which it is evident that he did not find any difference in the plumage or did not attach any importance to it.

Though there is rather a lot of individual variation in the tint of the under parts, it cannot be denied that fresh as well as old *javanica* material averages in having more buffy in the white than is the case in *longicauda*. In our series this character is most obvious in young birds as is shown in some juveniles from Princes Island. Two skins from Sebesi and Legundi Islands are clearer white, but two birds obtained on Sangiang Island and one from Udjung Kulon fit in well with *javanica* in this respect. The black on the chin is absent or very little in nearly all Strait Sunda specimens, except in both birds from Sangiang Island which clearly show black feathers on the chin.

In all these birds the white on the tail varies much in tint and extent and the same holds good with the black on the chest and the white area on foreneck and throat, in *javanica* as well as in *longicauda*.

In the studied series the colour of the upper parts averages a trifle darker in *longicauda* than in *javanica*. The few adult birds from Princes Island and one of the two skins from Sangiang Island, are distinctly lighter than *longicauda*, but both specimens from Sebesi and Legundi, a second bird from Sangiang and the only skin from Udjung Kulon, however, seem closer related to *longicauda* in regard to that character.

An old skin from the island of Bali, which is classified as *javanica*, fits well in *longicauda* because of its dark upper surface. This seems to cover Chasen's opinion[1] "the Bali bird is perhaps not *javanica*".

Another character of *javanica* present in nearly all skins of this race seen by me, consists of the ferruginous tint of the lower back and tail-coverts, which seems absent or hardly visible in *longicauda*. All skins from Princes Island show that ferruginous colour very obviously, the juveniles more strikingly than the adults. Also the Udjung Kulon bird—though with dark upper parts—shows this character well, but it is absent in the other birds from the Sunda Strait.

Though Princes Island birds do not differ in plumage from *javanica* it seems better to consider them as *javanica* ≷ *longicauda* on account of the very long tail of the males, which I consider as the character of paramount importance when comparing both populations. Even a juvenile bird, from this remarkable island has a tail of 93 mm. and the only adult male has the tail still longer (94 mm.) which is very long, even for *longicauda*! In view of the fact that I have only two adult females and one adult male from that island it is not advisable to propose separation of Princes Island's population of *Rhipidura javanica*, which might be justified, for besides the long tail, the differences in plumage may be of racial value.

The only male from Sebesi Island and one female from Legundi and the only male from Udjung Kulon have dark upper parts but resemble *javanica* in having a varying quantity of buffy in the white of the under parts; a female from Sangiang closely resembles *javanica* but a second bird (a male) from this small island situated just between Java and Sumatra, seems closely related to *longicauda* because of its dark upper surface and the long tail (93 mm.).

From the above it seems justified to look upon the area in and around the Sunda Strait as a territory of a mixed population in which it seems difficult to say which subspecies predominates, but on account of the long tail I suppose this to be *longicauda*, except in Java's most western peninsula Udjung Kulon, where perhaps lives a population with a short tail of *javanica* combined with the dark upper surface of *longicauda* and again the rufous tint on the back and upper tail-coverts of *javanica*.

From the measurements it seems evident that there is not much individual variation in wing size within the same subspecies. The tail, however, varies importantly and there is a fairly constant difference in the size of both sexes.

The male secured in October on Princes Island had large testicles (7 and 8 mm.) but the three adult females had the ovaries poorly developed (2) or well granular. The male obtained in July in Udjung Kulon had large gonads (7–8 mm.) and also a male shot in June on Sebesi Island had the reproductive organs rather large (2 and 3 mm.) but a female from the same island had the ovary hardly granular. A male from Sangiang Island had very large testicles (10 mm.) and the female had a well-granular ovary.

Among the small series secured in October on Princes Island, there are five fledglings and one pullus not yet able to fly.

Measurements (*in mm.*):

♂♂ *Wing; javanica* (Java): 75, 75, 76, 77, 79; *longicauda;* 79, 80, 80, 82, 82; *javanica* ≷ *longicauda* (Sunda Strait area): 78 (juv), 79, 80, 82.

Tail; javanica (Java): 80, 83, 85, 86, 90; *longicauda;* 88, 89, 92, 92, 92; *javanica* ≷ *longicauda* (Sunda Strait area): 89, 90, 93 (juv.), 94.

Culmen; javanica (Java): 10.6, 10.9, 10.9, 11, 11.2; *longicauda;* 11, 11.6, 11.8, 11.9, 12.1; *javanica* ≷ *longicauda* (Sunda Strait area): 10, 10.2, 11.1 (juv.).

Max., min., and average measurements:

	javanica	*longicauda*	*javanica* ≷ *longicauda*
Wing:	75–79	79–82	78–82
	76.40	80.60	79.75
Tail:	80–90	88–92	89–94
	84.80	90.60	91.50
Culmen:	10.6–11.2	11–12.1	10–11.1
	10.92	11.68	10.43

♀♀ *Wing; javanica* (Java): 71, 73, 75, 77, 79; *longicauda;* 73, 73, 73, 75; *javanica* ≷ *longicauda* (Sunda Strait area): 72, 72, 73 (juv.), 73 (juv.), 73, 74, 76, 76.

Tail; javanica (Java): 83, 83, 90, 90, 91; *longicauda;* 80, 84, 86, 87; *javanica* ≷ *longicauda* (Sunda Strait area): 79, 82 (juv.), 83, 83, 85 (juv.), 86, 90.

Culmen; javanica (Java): 8.5, 10, 10.2, 11, 11.8; *longicauda;* 10.2, 10.6, 10.9, 11.7; *javanica* ≷ *longicauda* (Sunda Strait area): 9.7 (juv.), 10.1, 10.3 (juv.), 10.9, 11.1, 11.1, 11.2, 11.9.

Max., min. and average measurements:

	javanica	*longicauda*	*javanica* ≷ *longicauda*
Wing:	71–79	73–75	72–76
	75	72.75	73.63
Tail:	83–91	80–87	79–90
	87.40	84.25	84
Culmen:	8.5–11.8	10.2–11.7	9.7–11.9
	10.30	10.85	10.77

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[1] Chasen, F. N. Handlist of Malaysian Birds: *Bull. Raffles Museum*, 11, 1935, p. 175: (footnote).

[2] Chasen, F. N. and Boden Kloss, C. On a collection of Birds from the Lowlands and Islands of North Borneo; *Bull. Raffles Museum*, Singapore, 4, 1930, p. 53/4.

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[4] Mayr, Ernst. Notes on a collection of Birds from South Borneo; *Bull. Raffles Museum*, Singapore, 14, 1938, p. 35.

[5] Wallace, Alfred R. Descriptions of new Birds from the Malay Archipelago; *Proceedings Zoological Society of London*, 1865, p. 476.

Weights of some Zambian birds

by R. J. Dowsett

Received 5th March, 1965

There are few published data on the weights of African birds, and the only previous records from Zambia (Northern Rhodesia) appear to be those of White (1948), who gives 81 weights of 40 species from the Mwinilunga district.

The present paper gives 480 weights of 56 species (the majority not included in White's data) collected from various parts of Zambia between 1962 and 1964. Weights have been taken with (a) a set of spring balances (by A. J. Tree or myself) and (b) a set of scales (by Tree). Both balances and scales are considered to be equally accurate, and there is unlikely to be any bias in the taking of weights by two different observers. I am grateful to Tree for making available weights obtained by himself.

Nomenclature follows Benson and White (1957). All weights and averages are given to the nearest 0.5 grms.

ad. = adult imm. = immature juv. = juvenile
M. = Male F. = Female Ave. = Average

Months and localities are mentioned only where considered relevant to weight.

Ixobrychus minutus (2) 2 ad. M, 95.5–114.5 Ave. 105.0 grms.

Gyps bengalensis (1) 1 ad. 5,488.

Neophron monachus (1) 1 ad. 2,270.

Accipiter ovampensis (1) 1 ad. M. 239.5.

Charadrius pecuarius (97) June: 1 ad. 37.5. Oct.: 96 ad. and juv. 25.0–43.5. Ave. 32.0 (All from Kafue Flats)

C. tricollaris (7) 26.0–37.0. Ave. 31.0.

Gallinago nigripennis (1) 1 imm. 133.0.

Calidris ferruginea (16) Oct.: 13, 43.0–60.0. Ave. 53.0 (All Kafue Flats). April: 3, 38.0–48.5 Ave. 42.0 (All Northern Province).

C. minuta (46) Sept.: 2, 19.0–21.0. Ave. 20.0. Oct.: 32, 17.0–26.0. Ave. 21.0. April: 12, 16.0–23.0. Ave. 19.0.

Philomachus pugnax (7) 1 F. Oct.: 92.0. 6 F. April: 72.0–99.0. Ave. 83.5.

Tringa hypoleucos (13) Aug.: 4, 39.5–45.5. Ave. 42.0. Sept.: 4, 38.0–47.0. Ave. 42.5. Oct.: 4, 46.0–53.0. Ave. 49.5. Jan.: 1, 41.0.

T. stagnatilis (2) Oct.: 2, 66.0–78.0. Ave. 72.0.

T. glareola (23) Aug.–Oct.: 8, 48.5–61.0. Ave. 56.5. Jan.: 3, 51.0–53.0. Ave. 52.0. April: 12, 51.0–65.0. Ave. 58.0.

Rostratula benghalensis (1) 1 ad. M. 104.0.
Chlidonias leucoptera (1) 1 Oct. 56.0.
Chrysococcyx cupreus (1) 1 ad. F. 31.0.
C. caprius (1) 1 ad. 30.5.
Ceryle rudis (2) 2 M. 74.0–77.0. Ave. 75.5.
Alcedo cristata (3) 3 ad. 16.5–19.5. Ave. 17.5.
Ceyx picta (2) Oct.: 1, 12.0. March: 1, 13.0.
Halcyon albiventris (1) 52.0.
Merops pusillus (3) 3 ad. 12.5–14.5. Ave. 14.0.
M. bulocki (1) 1 ad. 31.0.
Caprimulgus pectoralis (1) 1, 51.0.
C. fossii (3) 3, 44.0–64.0. Ave. 53.0.
Macrodipteryx vexillarius (1) 1 imm. F. April 52.0.
Chaetura boehmi (1) 1 ad. 20.5.
Campethera bennettii (1) 1 ad. M. 69.0.
Motacilla aguimp (55) 23.0–30.5. Ave. 27.0.
Anthus similis (1) 1 imm. 25.5.
A. novaeseelandiae (1) 20.5.
A. leucophrys (2) 2 ad. both weighed 26.0.
Terpsiphone viridis (2) Feb.: 1, 12.5. Oct.: 1 ad. M. 13.5.
Turdus libonyanus (3) 51.0–56.0. Ave. 54.0.
T. litsipsirupa (1) 1 ad. 70.5.
Oenanthe pileata (2) June: 1 ad. M. 32.5. Dec.: 1 juv. 24.0.
Saxicola torquata (6) 2 ad. M. 15.0–16.5. Ave. 16.0: 4 ad. F. 15.0–17.5. Ave. 16.0.
Cichladusa arquata (8) 31.0–37.0. Ave. 34.0.
Luscinia luscinia (2) Jan.: 1, 20.5. March: 1, 28.0.
Sylvia communis (2) Dec.: 2 imm. 14.5 and 15.0.
S. borin (3) Jan./Feb.: 19.0–24.0. Ave. 21.0.
Acrocephalus arundinaceus (6) Dec.–Feb.: 6, 27.0–34.5. Ave. 30.0.
A. palustris (3) Jan.: 3 imm. 10.0–11.5. Ave. 11.0.
A. schoenobaenus (1) April 1 ad. 11.0.
Hirundo rustica (105).

	Imm. (79)	Ad. (26)
Nov.:	(32) 14.5–20.0. Ave. 17.5	(6) 18.0–19.0. Ave. 19.0.
Dec.:	(39) 15.0–19.5. Ave. 17.5.	(15) 17.0–21.0. Ave. 19.0.
Jan.:	(8) 16.0–19.0. Ave. 17.5.	(5) 16.5–19.0. Ave. 17.5.

H. dimidiata (5) 5 ad. 10.0–12.0. Ave. 11.0.
H. smithii (9) 11.0–14.0. Ave. 12.5.
H. senegalensis (2) 1 ad. 43.0, 1 juv. 28.5.
H. semirufa (4) 4 ad. 28.0–34.0. Ave. 30.0.
H. abyssinica (9) 16.0–21.0. Ave. 17.0.
H. griseopyga (1) 1 ad. 9.0.
Delichon urbica (1) 1 imm. Jan.: 17.5.
Lanius cristatus (2) Jan.: 2 imm. F. weighed 28.5 each.
Nectarinia amethystina (2) 10.0 and 10.5.
Ploceus xanthops (1) 1 ad. M. 50.0.
Euplectes hordeaceus (1) 1 ad. F. 19.0.

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Incidents of aggressive behaviour by the Willow Warbler *Phylloscopus trochilus* (Linn.) in its winter quarters

by C. J. VERNON

Received 24th May, 1965

The Willow Warbler is a common Palaearctic migrant to Bulawayo, Rhodesia, between October and March. It is a lively bird which has a habit of darting after other birds. During 1964 this was recorded on thirty-two occasions between 3rd October and 27th November. The attacks were not provoked; instead the Willow Warbler waited for a bird to fly off before darting after it. On only two occasions did the Willow Warbler harass the victim, each time a Canary, to the extent of causing it to stall mid-air and change direction. The Willow Warbler usually met with indifference, except on one occasion when it darted out after a Grey Tit Babbler, *Myioparus plumbeus*, only to have the latter turn on it and chase it back to whence it came.

The Willow Warbler was attracted to singing or alarmed birds. A group of birds gathered to mob an owlet were darted at randomly by two Willow Warblers. A group of four Marico Flycatchers *Bradornis mariquensis* hawking insects from a tree were chased in turn by a Willow Warbler. The warbler would wait for a flycatcher to fly, dart out after it, return and wait for the next flycatcher to move. The most unusual bird chased was a Common Sandpiper, *Tringa hypoleucos:* a Willow Warbler in a bush overhanging a dam darted out twenty yards at the sandpiper as it flew past.

This behaviour appears not to be previously recorded for the Willow Warbler. The Icterine Warbler, *Hippolais icterina* was noticed to behave in a like manner on one occasion.

APPENDIX

List of species attacked by Willow Warbler.

(a) Larger birds:

Common Sandpiper, *Tringa hypoleucos*, 1.
Layard's Bulbul, *Pycnonotus barbatus*, 3.
Spotted Flycatcher, *Muscicapa striata*, 2.
Marico Flycatcher, *Bradornis mariquensis*, 1.
Bushveld Grass Warbler, *Cisticola chiniana*, 5.
Rufous-chested Swallow, *Hirundo semirufa*, 1.
Plum-coloured Starling, *Cinnyricinclus leucogaster*, 1.
Yellow Bishop bird, *Euplectes capensis*, 1.
Black-throated Canary, *Serinus atrogularis*, 4.
Golden-breasted bunting, *Emberiza flaviventris*, 1.

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(b) The same size as a Willow Warbler, or smaller:

Grey Tit Babbler, *Myioparus plumbeus*, 1.
Willow Warbler, *Phylloscopus trochilus*, 3.
Grey-backed Bush Warbler, *Camaroptera brevicaudata*, 1.
Tawny-flanked Prinia, *Prinia subflava*, 1.
Double-collared Sunbird, *Nectarinia chalybea*, 2.
Marico Sunbird, *Nectarinia mariquensis*, 4.

CONTRIBUTORS

Contributions are not restricted to members of the B.O.C. and should be addressed to the Editor, Mr. John Yealland, The Zoological Society of London, Regent's Park, London, N.W.1. These should be concise and typed on one side of the paper, double-spaced, with a good margin. The first time a species is mentioned, the scientific generic and specific names should be included. Subsequently the same name need only have the initial letter of the genus. Scientific names are printed in italics and should be underlined in the typescript. References should be given at the end of the paper.

Authors introducing a new name or describing a new species or race should indicate this in their title and display the name prominently in the text followed by *nom. nov.*, *sp. nov.*, *subsp. nov.* as appropriate. In these descriptions, the first introduction of the name should be followed by paragraphs for "Description", "Distribution", "Type", "Measurements of Type", "Material examined" and further sub-headings as required.

Proofs must be returned without delay. No changes may be made at this stage, other than corrections. At the discretion of the Editor, the Club will pay for a reasonable number of monochrome blocks, which the contributor may retain for his own use.

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Other correspondence should be addressed to the Hon. Secretary, Mr. Martin W. Woodcock, 34 Hill Road, Theydon Bois, Essex.

DINNERS AND MEETINGS FOR 1965

16th November and 21st December.

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Volume 85
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The six hundred and twenty-ninth meeting of the Club was held at the "Clarence", Dover Street, London on the 16th November, 1965.

Chairman: DR. J. F. MONK

Members present: 37; guests, 7

The Secretary explained that the form of the meeting with a cold supper in place of the usual dinner was an experiment and he invited suggestions regarding further meetings of this kind.

Dr. Jeffery Harrison described a visit to Iceland during the summer of 1965, illustrating his talk with many excellent photographs in colour taken by his wife, Dr. Pamela Harrison.

Dr. Harrison has kindly supplied this summary:—

Icelandic Birds

In late May and early June we spent most of the time at Myvatn in company with Mr. Sven-Axel Bengtson of Lund University. Apart from all the usual species illustrated, shots were shown of a Scaup x Tufted Duck hybrid and a Glaucous x Herring Gull hybrid.

Special mention was made of the status of wildlife on Myvatn, from which it appeared that a number of species were decreasing, particularly Long-tailed Duck and Common Scoter, as well as Harlequins on the Laxa river. Likely reasons mentioned for this were several, notably the silting of the lake which is rapidly becoming shallower, the expanding net fishing industry in the lake and depredation and disturbance from mink, which are spreading rapidly.

Survey work is now in progress for the establishment of a diatomite factory with an annual production of 24,000 tons, which will be extracted from the lake bottom. This may counter the effects of silting, but will involve the construction of a village to house 600 people. Increased disturbance on the lake seems inevitable and is likely to be serious.

Dr. Jeffery Harrison said that he thought that urgent consideration should be given to the establishment of some form of reserve on part of this unique lake before it was too late and he wondered whether this was not a project which was worthy of support from the World Wildlife Fund.

A Kentish Plover with a chestnut breast-band

by HAIM HOVEL

Received 13th August, 1965

On 18th July, 1958 I shot on the shore near Haifa a female Kentish Plover which had a distinct chestnut breast-band. This led me to identify the bird as a Chestnut-banded Sand-Plover, *Charadrius venustus* Fischer

& Reichenow, and a note concerning it appeared in this *Bulletin* (vol. 84, no. 9).

On my visit to the British Museum (Natural History) in August, 1964, the specimen was compared with a good series of *Charadrius venustus* and *C. alexandrinus* Linn. and was identified as belonging to the latter species.

Incidentally, the only somewhat similar specimen of Kentish Plover found by me in the British Museum series and which had an incomplete chestnut breast-band was collected at Yaffo, about 100 km. south of Haifa. *Charadrius alexandrinus* breeds in Israel.

My thanks are due to Mr. J. D. Macdonald and to Mr. P. R. Colston of the British Museum for their kind help.

Fieldnotes on the birds of the Santa Cruz Islands, south-west Pacific

by C. J. Hadley and S. A. Parker*

Received 11th June, 1965

INTRODUCTION

The Santa Cruz Islands are a small group situated in the south-west Pacific east of the Solomon Islands and north of the New Hebrides, and equidistant from the two. With the exception of the Slaty Flycatcher *Mayrornis schistaceus* (*q.v.*), no fieldnotes on the birds of the group have previously been published, and in most cases the habits and ecology of the non-endemic species are little known.

The following observations were recorded by C.J.H. during three and a half years spent in the group while a forest officer in the service of the government of the British Solomon Islands Protectorate. Most of the observations were made on Vanikoro, especially in the secondary forest surrounding his house at 100 feet above sea level, where a ground-cover of fern and clubmoss grows under a light shade of *Trichospermum* and *Commersonia* trees.

Further inland on Vanikoro the terrain becomes more mountainous, developing into a system of steep ridges divided by fast torrents, and the vegetation alternates between the tangle and chaos of recently felled areas and the mossy twilight of three-storied montane rain forest. Here the forest dominants are *Calophyllum* sp., *Campnosperma brevipetiolata*, and the hurricane-resisting Kauri Pine, *Agathis macrophylla*, which tends to form clumps in the well-drained situations offered by the crests of ridges (Hadley, 1959). The lowest storey of this forest seems to be particularly the home of the Vanikoro Broadbill and the endemic Slaty Flycatcher. Though these two species could sometimes be found nearer the settlement, the commoner and more conspicuous species there are Golden Whistler, Rufous Fantail and Cardinal Honeyeater.

At about 1,400 feet a stunted form of forest begins, and continues to the summit of Vanikoro at 3,000 feet. Here few birds were seen.

Below the house, by the tidal part of the Lawrence River, lies a cow-pasture inhabited by swamphens and occasional sandpipers. Beyond is a short sand beach, the fringing reef, and miles of coastal mangroves.

The other main islands of the group, namely Ndeni (Santa Cruz),

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* Account constructed by S.A.P. from data supplied by C.J.H.

Utupua and Ticopia were all visited, though only on the first was any length of time spent.

Rainfall throughout the group is capricious, with no marked wet or dry season. It is apt to be high, and an average of 233 inches per annum was recorded over a fifteen-year period at the coast on Vanikoro. The only seasonal effect is the alternation between the "South-East season", April–October, and the "North-West season", November–March, in which the trade-wind is weaker. The few references to breeding and young birds (below) indicate that the breeding season on Vanikoro occupies the South-East season (but see the Vanikoro Swiftlet).

Descriptions of the species listed below will be found in Mayr, 1945, though some wader records have been quoted fully as an additional aid to field identification.

Brown Booby (*Sula leucogaster*). On 12th April (1955), a.m., several flocks each of 100+ were seen near Utupua, heading in a W. or N.W. direction.

Little Pied Cormorant (*Phalacrocorax melanoleucos*). Two were seen on the Sundi River, Vanikoro, on 4th April (1957), flying out to sea. Not previously recorded from Vanikoro (Mayr, 1945 : 202).

Mangrove Heron (*Butorides striatus*). Often seen by mangroves on Ndeni and Utupua. One observed in Ndeni on 12th November (1955) had yellow legs and orange feet.

Reef Heron (*Egretta sacra*). Recorded on Vanikoro during March and July, on the Sundi and Lawrence rivers and along the seashore amongst coral and on sand-beaches. Of those recorded, seven were white and one was blue-grey. A white bird was seen on Utupua, 1st November (1955), on a sandspit enclosing a small lagoon.

Grey Duck (*Anas superciliosa*). Seen on Ticopia lake. A single bird was observed flying east between Vanikoro and Utupua on 12th April (1955). Another was seen over the settlement on Vanikoro on 19th April (1957). Ticopia is the only island of the group from which this species has previously been recorded (Mayr, 1945 : 202).

Pied Hawk (*Accipiter albogularis*). Common throughout the Protectorate. On Vanikoro it was tame and often seen in the garden.

Swamphen (*Porphyrio porphyrio*). Common and widespread on Vanikoro, where not previously recorded (Mayr, 1945 : 203). Observed in groups up to 1,400 feet. It prefers the thick cover in secondary forest, *i.e.* where timber has been worked, and was rarely noted in primary forest. It also frequented the low, swampy cow-pasture and the garden, where it would dig up the beans. It has a sharp, short, hoarse cry. One shot on 4th June (1957) weighed 1½ lbs.

Golden Plover (*Pluvialis dominica*). On 23rd October (1955) a party of four birds (two males, one female and one juvenile) was seen on the house lawn, the first time that this species had been noted away from the sea on Vanikoro. Its inland occurrence may have been connected with a recent period of stormy weather (the wind just having dropped), though Mayr (1945 : 37) states that it is to be found more often inland than any other shore bird of the area. The party was put to flight by dives from a Polynesian Triller. On Utupua, 1st November (1955), on a sandspit enclosing a small lagoon, nine or more of these plovers were seen, near a couple of Turnstones.

Common Sandpiper (*Tringa hypoleucos*). On Vanikoro, 2nd March (1958), two were seen feeding on the freshly-covered reef just around sunset. The fieldnotes read: "Tail jerking, buff on chest, white underneath, white shoulder, dark line through eye and pale above (indistinct), white wing feathers in flight." It was almost certainly this species seen feeding in the tadpole-filled pools of the lowland watermeadows.

Turnstone (*Arenaria interpres*). On Utupua, 1st November (1955), two in winter plumage were observed on a sandspit enclosing a small lagoon. Nearby was a party of Golden Plovers. Another was seen at Napir, on Ndeni, 10th November (1955), amongst rocks by the seashore.

Grey-tailed Tattler (*Tringa incana*). Recorded twice on Vanikoro. On 18th October (1957), one was seen flying up and down the Willi-Willi River, and on 2nd March (1958) a party of six on a sandbank was approached to within 8 feet. The fieldnotes for the latter observation read: "Body jerking regularly. *c.* 8 inches long, slender and graceful. Smooth grey all over except for white belly. Bill of medium length, fairly stout. Eye black with fine white ring all around. Legs dull yellow." On Utupua, 1st November (1955), a lone bird was seen perched on a stump, on a sandspit enclosing a lagoon. Nearby were several Golden Plovers and Turnstones.

Sharp-tailed Sandpiper (*Calidris acuminata*). Recorded once on the shore on Vanikoro, 24th July (1955).

White-headed Stilt (*Himantopus himantopus*). Twice seen on Vanikoro. On 2nd June (1957) two birds flew from inland over the cow-pasture in the direction of the Lawrence River. Their white bodies, black pointed wings, black collars, long trailing reddish legs and strong tern-like flight were noted. Conditions were overcast and very gusty. Eleven days later the weather was fine and there was a neap tide. Two stilts were seen at the river mouth. One bird was slightly taller than the other and not so pure about the head. In the south-west Pacific only New Britain has previously been recorded for this species, whose nearest breeding grounds are in Australia (Mayr, 1945 : 46).

White-capped Noddy (*Anous tenuirostris*). A sooty bird with a white crown was seen at the Sundi River landing on 28th March (1958), perched on a log in the water.

Green-winged Ground Pigeon (*Chalcophaps indica*). Only one record, on Vanikoro, of a bird seen flying into secondary forest from a small forest nursery on 11th June (1955).

Pacific Pigeon (*Ducula pacifica*). Only seen twice on Vanikoro, on 14th August (1955) and 15th June (1958).

Barn Owl (*Tyto alba*). A barn owl was once seen on Vanikoro.

Glossy Swiftlet (*Collocalia esculenta*). A specimen was taken on Vanikoro on 3rd June (1958).

Vanikoro Swiftlet (*Collocalia vanikorensis*). Mayr (1945 : 76) states that the nest and nest-location of this species are insufficiently described. These swiftlets were found breeding on Ndeni on 2nd January (1956). The colony was in the limestone cave of an underground river, and was a quarter of a mile from daylight. The nests were on the walls of the cave, which was also occupied by a great number of bats of several species, amongst them the species *Emballonura raffrayana*. A juvenile and adult swiftlet were collected; the adult was asleep on its nest and did not wake up until after night had fallen, several hours after its capture.

White-collared Kingfisher (*Halcyon chloris*). Common on Vanikoro, where recorded from mangroves and gardens. It has a harsh cry.

Polynesian Triller (*Lalage maculosa*). Often seen in lowland forest and secondary growth on Vanikoro, generally in twos and threes, at treetop height. It uses conspicuous perches. The call is a single note, "tchip", sometimes repeated. A party of four Golden Plovers (*q.v.*) was once put to flight from the house lawn by bold dives from a triller. On 18th June (1954), while bush was being cleared from a knoll at 100 feet, a nest was found about 20 feet up in a small tree. It was subsequently deserted and found to contain one heavily incubated egg, 0.9 inches in length and blue-green with brown markings concentrated at the large end.

Rufous Fantail (*Rhipidura rufifrons*). The commonest small bird on Vanikoro, found in plantation strips, secondary and primary forest up to 1,500 feet, generally foraging in the substage and midstage with other small birds. The close social relationship between this species and *Mayrornis schistaceus* has already been mentioned (Parker, 1963). Apart from an excited twittering, heard when the fantail was with this flycatcher, the voice includes a descending fairy-like trilling song. An immature bird was seen on 14th June (1958).

Slaty Flycatcher (*Mayrornis schistaceus*). The habits of this species have been noted elsewhere (Parker, 1963). It remains to add that the first nest referred to there was built and used during a period of very wet weather, and was situated in a plantation consisting of lines thirty feet apart cut through the forest and planted with kauri saplings. The nest was on the edge of one of these lines.

Vanikoro Broadbill (*Myiagra vanikorensis*). A shy species often seen on Vanikoro in lowland forest and plantation strips, though preferring primary growth. Observed singly and in pairs, frequently in feeding parties with other small birds (*Pachycephala*, *Myzomela*, *Mayrornis*, *Rhipidura*), mainly in the lowest stage of the forest but also at treetop height. It was noted as darting from its perch to catch insects and returning to the same perch. It repeatedly jerks the tail downwards when perched. The call is a harsh, metallic grating note, "tzk, tzk", also a "see-saw" note. A nest was found on 26th May (1957) in secondary growth near a stream, about 10 feet up in a fork of a slender sloping tree. It was of the same size and appearance as the nest of *Mayrornis schistaceus* found on 3rd June (1955) (Parker, 1963), and was decorated similarly with pieces of fungus skin. Both sexes were taking turns to incubate at quite frequent intervals. On leaving the nest the male appeared to stand up or stretch forward horizontally, beating his wings until he became airborne. By 10th June, however, the nest was deserted. A young bird was seen on 14th June (1958).

Golden Whistler (*Pachycephala pectoralis*). A common and conspicuous bird on Vanikoro, found equally in secondary growth (including the edges of gardens) and virgin forest up to 1,500 feet. It is the chief songbird of the island, its sweet liquid notes being especially noticeable at dawn. Often seen, in family groups and in association with *Mayrornis Myiagra*, *Myzomela* and *Rhipidura*. A female was seen feeding an adult-sized young in a thicket on 15th November (1954). The young was continually fanning its wings, while nearby another young whistler was feeding at ground level and making a chucking noise. On 11th June (1955) in secondary forest a female and young were seen foraging near ground level. In both instances the males were observed nearby in the treetops. On 24th July (1955) a female was seen taking food to a large fledgeling perched about 14 feet above ground amid dense foliage in the forest. The fledgeling was shivering its right wing and cheeping, and its agitation increased as the female approached. On 14th June (1958) territorial behaviour was observed. Two males were singing at each other across a path through a plantation when a third male attacked one of them and all three flew off into the plantation. A female or young bird was in the background. The three males remained nearby singing. The song of this species may be rendered as "weet-weet-weet-tu-weet'le tu weet u," also a low husky "tu tu tu tu weet u" and variants. An individual in a feeding party gave a defiant sound, like a clockwork car unwinding rapidly. Dawn duetting also occurs. A whistler often seemed to be with the party during surveys in the forest, singing from just ahead or nearby; possibly the party passed from one bird's territory to another's.

Cardinal Honeyeater (*Myzomela cardinalis*). A common bird of gardens, plantations and secondary forest on Vanikoro, twice observed in virgin kauri forest at 700 feet and 1,500 feet. Seen singly or in pairs, often in feeding parties with the other small birds (*Pachycephala*, *Mayrornis*, *Rhipidura*, *Myiagra*). One was seen hovering to catch an insect. The call is "a single note consisting of several notes together".

I. C. J. Galbraith (pers. comm.) comments that on San Cristoval and Ugi in the eastern Solomons he found this species mainly along the shore among coconut palms, where it was so common that pairs could not be distinguished and the birds seemed to chase each other at random. On these islands this honeyeater was much commoner than *Rhipidura rufifrons*, while on Vanikoro the fantail is the commonest small bird.

Rusty-winged Starling (*Aplonis zelandicus*). Infrequently seen on Vanikoro, in plantations and the midstage of the lowland forest (once thought to have been seen at 1,500 feet), sometimes singly, though once in a flock of at least a dozen. They are rather dumpy, thrush-sized birds with short tails and flattish heads. Apart from the sharp tappings of their beaks on the tree trunks (feeding or excavating ? No details) they were quiet, even secretive. They twist their heads around a lot.

The shy and secretive manner of this species recalls that of *A. santovestris* of Espiritu Santo, New Hebrides (Harrisson and Marshall, 1937 : 149) and the related *A. pelzelni* of Ponape (Baker, 1951 : 299), both reported as nesting in cavities in trees. As *A. zelandicus* is capable of administering audible blows to tree trunks with its bill, does it, like the Celebes starling *Scissirostrum dubium*, excavate nestholes?

CENSUS

On 14th June (1958) a rough census was carried out of a six-acre plantation beside a stream. The area comprised plantation strips and relict primary undergrowth. In one main feeding party and one smaller association were counted 5–6 *Pachycephala pectoralis*, including two juveniles, three *Myiagra vanikorensis*, including one juvenile, three *Rhipidura rufifrons*, two *Mayrornis schistaceus* and two *Myzomela cardinalis*, one a juvenile. Two and three *Lalage maculosa* were not associated with either party. Total number of individuals seen was 20–21.

ACKNOWLEDGEMENT

We thank Mr. I. C. J. Galbraith of the Bird Section, British Museum (Natural History) for his valuable comments on this paper in the draft stage.

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On the Red-headed Quelea, *Quelea erythrops* (Hartlaub) in Zambia

by A. J. Tree

Received 12th July, 1965

Distribution. Scattered records from all provinces north of about 14° S., except on the Kafue where recorded to at least 16° 45′S. and from Kalabo, in Barotseland, at 15° 00′ S. Appears to be confined to water during the breeding season, most records coming from the upper Zambesi, Kabompo and Kafue Rivers, Mweru Marsh and Lake Tanganyika, and records from other localities close to the Luapula and Chambeshi Rivers from which they had probably wandered. Recorded only once from the Luangwa River.

Status on the Kafue River. Virtually all my observations have been made on the Kafue though I think that most comments from there would apply to the Zambian population as a whole.

Appears to be very common from near the south-east corner of the Kafue National Park at 16° 45′ S., 26° 08′ E. upstream as far as the swamps and floodplains in the area of the Kafue/Luswishi confluence (13° 55′ S., 27° 25′ E.) with lesser numbers to Ndubeni (13° 24′ S., 27° 49′ E.) and very few on the Copperbelt, in fact is probably only on passage there. Flocks of up to 300 have been noted at Ndubeni in January and flocks of up to 400 totalling some thousands along the Kafue between Mswebi (14° 24′ S., 27° 42′ E.) and the Kafue/Luswishi confluence in late January and February. The large numbers were localised, however, to Mswebi, the Kafue/Lukanga confluence (14° 22′ S., 27° 11′ E.), Supuni Ferry and about five miles upstream (14° 18′ S., 27° 16/21′ E.), and the Kafue/Luswishi confluence together with the adjoining Chanya Swamp.

Breeding. Few definite breeding records have been published to date, see Benson (1956) for breeding at Mpulungu on Lake Tanganyika, and Benson and White (1959) for breeding at the southern extremities of its range on the Kafue.

On the 4th February, 1961, at Kasha in the Kafue National Park

(16° 15′ S., 25° 53′ E.) J. B. Shenton found a colony of some 250 nests in a patch of sedge by a pond, some nests containing complete, partially incubated clutches of as many as four eggs. Other nests were still being built. R. C. Hart collected ♂♂ in breeding dress, with testes fully developed, at Kalabo in December and January, these now being in the Livingstone Museum.

In February, 1965, I found two colonies on the Kafue—a fairly large colony at Mswebi in a very extensive reed bed of *Phragmites*, and the other in a similar, though smaller, reed bed about 1½ miles up the Lukanga River from its confluence with the Kafue. The colony at Mswebi was inaccessible but could be watched from the top of an ant-hill close by on the edge of some woodland. In fact there were probably several small colonies in the one reed bed. The first young were recorded on the wing on the 14th February but mostly from about the 20th. The colony was deserted by about the 25th when all the young had left the nest. Thus eggs probably laid during the period 20th/30th January.

The Lukanga colony was discovered on the 17th February but only a few nests were accessible, a couple of which had been freshly deserted, the young still hanging around soliciting food from their parents (both sexes taking part in feeding), and one nest held two fully fledged young just about to leave. The young had evidently all fledged and the colony deserted by about the 25th February.

In 1964 many young birds were noted on the wing by the 20th February at Ndubeni but no breeding colony was discovered.

From banding the percentage of ♀♀ to ♂♂ appeared in the ratio of about 3 : 1.

Movements. In all, from Zambia, there are some 57 specimens, collected in the period 16th September–15th April, in the National Museum, Bulawayo, and the Livingstone Museum. From my own records on the Kafue I find that the first birds arrive at the end of October, though the main numbers do not arrive till late December and early January. The main numbers appear to have left by the end of March with one record for the 8th April, 1965, from Kyimbwe Salt Pan (13° 04′ S., 25° 57′ E.)—a red-headed ♂; and one caught at Ndubeni on the 20th May, 1965—probably an immature. This last record can probably be considered as exceptional. There are, however, records from Mwinilunga District in the extreme north-west of N.W. Province and from Lake Tanganyika as late as mid-April. The September records were of birds collected by Benson at Salujinga (10° 58′ S., 24° 07′ E.) on the 17th and 19th, and from Kawambwa, in Luapula Province, on the 16th. Even though ♂♂ are only in red-headed breeding dress from about November to April, it is unlikely that they have been overlooked in the intervening period, especially as I have been banding on the Kafue throughout the year since 1962.

After the breeding colonies have been deserted there appears to be a drift upstream on the Kafue. On the 25th February, 1965, the largest concentrations were on the stretch past Supuni Ferry but by the 27th the largest numbers were to be found on the Chibwenda Plain, just below Chilenga (14° 06′ S., 27° 25′ E.). By this time there were very few noted downstream of Supuni Ferry. Small parties were seen continuously heading upstream.

Migration would be northwards, possibly into the Congo or to Kenya and Tanzania

Moult. The ♂♂ start moulting into breeding dress from about mid-November and some have completed it by mid-December though many not until mid-January and the odd ones up until early February. However, Benson collected a ♂ with red head as early as 22nd October at Kabompo. The complete moult of both sexes probably takes place in the latter half of April till mid-June, as in the Red-billed Quelea (*Quelea quelea*), and the immatures during the period latter half of May to about mid-July.

Measurements:	*Wing*	*Bill*	*Tarsus*	*Tail*
♂♂ (123)	61–67	14–16	18.5–21	31–39
♀♀ (378)	57–65	13.5–15.5	17.5–20	30–36

Measurements are in millimetres, the wing measurements are minimum chord and the bill is measured to the skull.

Some 93 juveniles have been banded but their measurements have not been taken into consideration.

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Pattern of dispersion of the White Wagtail and other birds outside the breeding season

by K. E. L. SIMMONS

Received 5th August, 1965

These notes on the White Wagtail *Motacilla a. alba* Linn. in winter quarters in Egypt are based on observations made during the winter of 1949–50, mainly in the Fayid district (Canal Zone) and at Adabiya (Gulf of Suez). They were originally drafted in 1950 and are now discussed in the light of recent work on avian social systems, especially that of Crook (1965).

GENERAL

Arrival and departure

The White Wagtail is an abundant winter visitor to Egypt and Sinai (Meinertzhagen 1930). In 1949, passage birds were first seen in the Fayid district from 22nd September onwards, passing over singly or in small parties. The first bird was seen on the ground in the native cultivation near the Great Bitter Lake on 2nd October and in a nursery garden near the Sweet Water Canal on 22nd October. From then on, the species was common and resident in the area. At Adabiya, the first White Wagtail was seen on the ground on 19th October and all the resident birds (see below) were established by the end of the month.

Departure in the spring was not closely followed but took place in March and early April 1950. The last bird was recorded at Adabiya on 5th April.

Habitat

In Lower Egypt, the wintering White Wagtails are found in a variety of habitats, both rural and urban, often though not exclusively near water, wherever the ground is clear enough for them to forage. The native cultivation is chiefly favoured; also parks, public gardens and courtyards, and the shores of lakes, lagoons and irrigation streams.

In the Canal Zone, at least during the former British occupation, the White Wagtail had also extended its range into the desert, well away from water, by haunting the military camps and similar establishments. The attachment to human habitation was very marked, as shown by the following examples. In October, a party of migrating wagtails dropped down and fed about a temporary group of army vehicles in the middle of the Suez-Cairo desert. In February, White Wagtails were found to be common round a large, isolated factory that was being constructed in the desert west of Suez, though House Sparrows *Passer domesticus* were still rarer than might have been expected. Meinertzhagen (1930) also mentions the White Wagtail as one of a number of species that visited H. J. L. Beadnell's encampment in absolutely bare desert at Bir Tarfawi, 200 miles south of Dakla Oasis, between 19th February and 11th April, 1927.

Food

No detailed study has yet been made on the feeding ecology of the White Wagtail in winter quarters but it is known to eat insects and similar small prey. The birds normally feed on the ground and will also take wing from the ground after flying insects. In February, one bird was seen walking alongside a small irrigation stream and frequently flying out to hover over the water to take organisms from the surface.

At least in some instances, those birds living about the military camps supplement their normal diet with scraps, including bread crumbs (Goodwin, 1950).

PATTERN OF DISPERSION

Canal Zone

Once the birds were settled in their winter quarters in 1949–50, it soon became evident that, although they assembled at communal roosts for the night, they were not social by day also but were "over-dispersed" in their habitat, *i.e.* they were not aggregated but more evenly distributed than they would be if distributed at random (see Hinde, 1956).

Individual wagtails (mainly adult males but also grey-headed birds) and a minority of "pairs" (associations of a female with a male) daily frequented the same limited feeding area in which they were isolated from other White Wagtails. In the previous winter (1948–49) at Fayid, D. J. May (*in litt.*) had found that forty-nine individuals could regularly be located, each feeding in its own area.

Observations in 1949–50, showed that the wagtails were well spaced out in their feeding areas which, however, were not clearly delimited like the winter territories of Robins *Erithacus rubecula*, chats *Oenanthe* spp. or shrikes *Lanius* spp. The wagtails did not spend all their time in their known feeding area. They could be driven away by the observer, they sometimes left voluntarily during the day, while in the evening they deserted it for the communal roost.

It would seem that many of the birds had other, probably subsidiary feeding areas besides the main one, some permanent, some temporary, though in all these the occupants remained isolated.

While the wagtails' winter feeding areas did not have all the characteristics of true territories, nevertheless they must sometimes at least be considered as such, for the owners would "defend" them from intruders when necessary, mainly by chasing, and males would sing in their main feeding area at least. (See Hartley [1946] for an account of song in winter quarters.)

Adabiya

Here a small military camp had a resident winter population of one "pair" and at least four other individuals (two males and two females), all well spaced out in their own feeding areas. These "units" seemed to keep apart largely by mutual avoidance and seldom came into contact, though occasional chases were recorded. On one occasion, the male of the "pair" was aggressive towards a Desert Lark *Ammomanes deserti.*

The "pair" was watched intermittently over a period of four and a half months. The birds had one main feeding area in which they were located day after day and also, at times, frequented at least one other feeding area in another part of the camp. Sometimes, either the male or the female was located alone in the main feeding area.

It was obvious that the permanancy of the couple depended on the female's attachment to the male (see Simmons 1954). He always took the initiative in joint movement, flying up and the female following. All hostility was by the male to the female. On several occasions, when the two birds were feeding, he was seen to run aggressively at her if she approached him too closely. Similarly, when the birds were flying, he would pursue her if she came too near. Twice he ran at her when she had discovered food. His aggressiveness seemed to increase as time passed until the female kept well away from him, although still occupying the same areas. No display of any kind was recorded from the male but the female was once observed to elevate her long tail while in his presence.

Arrival from the roost was observed once. On 5th November, the male flew in at 06.00 local time, perched on a stone and remained there singing for 20–30 minutes. The female did not arrive until some thirty minutes after the male.

Observations elsewhere in Egypt

Greaves (1941) studied the White Wagtail in the Cairo district and found that "individuals exercised a territorial habit in feeding, and regularly frequented the same garden. A male would dispute his right with another male but generally tolerated a female on his territory, sometimes two, but as observations continued it seemed clear that the association was a loose one. The female for most of the season was in close attendance on the male, and often followed him, but at other times fed alone."

Goodwin (1950) observed White Wagtails in Lower Egypt, the coastal districts of Eastern Libya and Malta and found that the birds "usually associated in pairs, or at least a male and a female together. Even in the wet fields of the Nile Valley with their dense wagtail population the tendency to split up into pairs was very noticeable." He made close observations on a "pair" near Cairo in the winter of 1944–45 and found the behaviour similar to that seen "on very many occasions with other White Wagtails in all the countries mentioned." The two birds "shared a common territory—perhaps "foraging area" would be a safer term since they frequently flew off for short periods and the boundaries, if any, were very ill-defined." He noted the evening absence at the roost and that, in this case, the female usually returned earlier than the male in the mornings. Display by the female to the male was seen, to which he sometimes responded by darting at her aggressively. As with the Adabiya "pair", the male usually initiated flight, the female following.

Variations between districts

As with so many species, it would seem that the available food supply determines, to a large extent, the exact details of the diurnal social system shown by White Wagtails in any one locality. The density of birds, the closeness of the individual feeding areas to each other, the degree of definition of boundaries, the number of territorial encounters, the proportion of "pairs" to single birds, the amount of aggressiveness shown by the male towards the female, the need for alternative feeding places—all these must largely be dependent on the nature of the local food supply.

In the more favourable feeding habitats (*e.g.* the Nile Delta), one would expect a greater density of birds, more compact groups of feeding territories, a greater proportion of "pairs" (with less overall aggressiveness by the male to the female), and a greater adherance to the main feeding territory. There might even be temporary aggregations of birds at abundant food sources, for Greaves (1936) records that White Wagtails constantly follow the plough in the Nile Delta and also frequent open-air grain stores ("shounas") to feed on the bean weevil *Bruchus*. Conversely, in less favourable habitats (such as the military camps in the Canal Zone), there would tend to be a much lower density of birds, with feeding areas more scattered and less clearly defined, many more single than double occupancies (with the male less tolerant of the female) and a less strict adherence to the main feeding area.

Observations in the various districts suggest that the above "predictions" are in fact realized. However, much more study is needed before a complete picture of the White Wagtail's ecology is obtained. Detailed comparison with other wagtail species (Motacillidae) would be rewarding, especially with those that feed socially in winter quarters (see below).

Roosting

The habit of social roosting seems to be constant throughout the winter range of the White Wagtail. The roosting habits in the Cairo district have been described by Greaves (1941). Parties form and later fly to the roost which may contain up to 2,000 birds or more. Roosts were sited in thick vegetation—sugar-cane which "at this season . . . is a dense growth, eight or ten feet high, affording cover similar to a dense reed-bed". On 25th March, 1950, the writer was shown a large urban roost at Gezira (Cairo) by the late R. H. Greaves. This was situated in a row of small trees, near buildings and a busy thoroughfare, on the banks of the Nile.

No roosts were located in the Adabiya and Fayid districts though, in the latter, flighting birds were frequently seen passing on their way to roost. Such movement is quite typical; the birds do not move in tight flocks but loosely, either individually or in small parties "well separated and spread out lengthways" (Greaves, 1941). A preliminary gathering was watched in the nursery garden at Fayid one evening in November. About ten birds perched on a wire fence, on telegraph wires and on the ground, calling and feeding. Short chases, on the ground and in the air, occurred when individuals came too close to one another.

DISCUSSION

Observations from a number of districts in Lower Egypt establish that White Wagtails in winter quarters are:

(a) Over-dispersed in small individual feeding-areas by day,
(b) Social by night when they occupy communal roosts.

Such a pattern of dispersion appears not to be a common one and this anomaly is discussed in the remaining sections of the paper.

Social systems outside the breeding season

In a recent broadcast discussion (1964), the writer outlined four possible categories of dispersion in relation to roosting for birds outside the breeding season. Of these social systems, the first two would appear to be by far the most common, the last two much less so.

Species may be allocated thus:—

1. SOCIAL-SOCIAL; individuals feed socially by day, in flocks which often range over wide areas and often combine with other flocks to roost socially by night.

   Examples from Europe include the Rook *Corvus frugilegus*, Jackdaw *C. monedula*, Fieldfare *Turdus pilaris*, Redwing *T. musicus*, Starling *Sturnus vulgaris* and Wood Pigeon *Columba palumbus;* and from Egypt and elsewhere in Africa the House Sparrow, the Black-faced Dioch *Quelea quelea*, forms of *Motacilla flava* and the Cattle Egret *Ardeola ibis*.
2. SOLITARY-SOLITARY; individuals feed alone by day, usually in delimited areas, and roost alone in the living area by night.

   Many species occupying winter territories belong in this category, including the Robin in Europe and the Great Grey Shrike *Lanius excubitor* in Egypt; also species that are otherwise over-dispersed without actually defending a territory, such as various warblers (Sylviinae) (Simmons 1954).
3. SOCIAL-SOLITARY; individuals feed socially by day in flocks and roost alone at night.

   The Great and Blue Tits *Parus major* and *P. caeruleus* provide the main example (Kluijver 1950, Hinde 1952) but resident individuals of some ''social-social'' species, such as the House Sparrow (Summers-Smith 1963), Chaffinch (Marler 1956) and Starling (Morley 1941) may also be assigned here.
4. SOLITARY-SOCIAL; individuals feed alone by day and roost socially by night.

   Besides the White Wagtail, the Common Sandpiper *Tringa hypoleucos* also apparently belongs to this category (Simmons 1951), as also do the Marsh and Montagu Harriers *Circus aeruginosus* and *C. pygargus* (Meinertzhagen 1956).

(Note: In all the above examples only the less well known ones have been documented.)

Diurnal dispersion and feeding habits outside the breeding season

Some species of wagtail are social by day. For instance, the various forms of *Motacilla flava* (Blue-headed Wagtail, etc.) flush winged insect prey by communal foraging in grassland and the like and also by associating, to a much greater extent than the White Wagtail, with grazing animals. The solitary diurnal dispersion of the White Wagtail in individual feeding-areas strongly suggests that this species specializes in feeding on over-dispersed prey that requires individual skill for its location and capture.

A species' manner of daytime dispersion would appear to be largely determined by its feeding ecology (Crook 1965). Solitary foraging is characteristic of birds whose main prey is hidden, or otherwise difficult to obtain, and not usually concentrated in parts of the habitat. Gregarious behaviour is disadvantageous to such species as it would interfere with individual methods of obtaining food. On the other hand, birds that specialize in taking locally abundant foods found in patches in the habitat tend to be gregarious because such behaviour ensures that the majority of the local population accumulates over the richest feeding grounds, the individual's chances of locating food being increased.

Factors determining roosting behaviour outside the breeding season

The White Wagtail differs from most other social roosting birds in being a solitary feeder by day, and from most solitary feeding birds in roosting socially at night. That social roosting has evolved in this species indicates that there has been selection against solitary roosting, both in the feeding area itself and away from it. Three questions may be put:

(*a*) Why do the birds not roost in their feeding areas?
(*b*) Why do they not roost individually elsewhere?
(*c*) Why do they roost socially?

There has been much discussion in the literature about the survival value of roosting patterns, particularly social roosting. It is extremely doubtful if there is a simple, unitary explanation, for the evolution of such behaviour must have involved a compromise between various selection pressures, including predation (and different types of predation), the need for shelter and warmth (where applicable), feeding requirements and social habits. Of these, that brought to bear by predation would seem to be very important, at least at some stage, for unless the roosting habits of a species ensure that predation is not excessive any other advantages conferred will be considerably reduced. In the following discussion, therefore, particular emphasis will be placed on the importance of predator pressure.

Selection has most favoured solitary roosting in birds and here the question of safety, particularly from predators, would seem to be paramount. There is a marked correlation between solitary roosting and intimate knowledge of a restricted locality. Individuals that roost alone, almost invariably return nightly to known, highly protective roost sites. This is the case particularly in typical "solitary-solitary" species which are highly sedentary and intimately familiar with their living areas. Social roosting with potential food competitors is of no advantage to such birds. In addition, certain individuals of otherwise "social-social" species, instead of using the local communal roost, disperse at night to solitary roosts, this also being the usual pattern in "social-solitary" species such as some tits. In both cases, the birds involved tend to be local residents within range of their previous breeding areas returning to the safety of known roost sites, such behaviour being particularly characteristic of species that sleep in holes.

Solitary roosting in the feeding area has most probably been selected against in the White Wagtail, and in a few other species that are also over-dispersed outside the breeding season, because such areas tend to be too small and open to provide safe, individual roost sites in them. Similarly, solitary roosting elsewhere must also have proved disadvantageous for safety reasons because each bird would have to pioneer its own roost site in unfamiliar country, thus considerably increasing the risk of excessive predation for the population as a whole. Instead of roosting individually, therefore, the birds frequent the already established communal roost, the one site locally that is familiar to all the population.

The safety factor must also be important in the case of typical "social-social" species. Most of these frequent open habitats and range widely each day in search of food. It would be dangerous to pioneer new roost sites, solitary or communal, where feeding happened to stop each evening in order for the birds to remain on or near the feeding grounds. Greater safety in roosting is achieved by the majority of birds returning to the established communal roost, especially immigrants and young birds that are not familiar with the locality and possess no previously known safe roost sites of their own.

Many communal roosts are traditional, their safety attested by generations of use. Such roosts probably help to reduce predation by

(*a*) decreasing the area of night dispersion of the population frequenting them,

(*b*) being sited in relatively safe places, *i.e.* where there are few or no local predators or where access by predators is difficult.

It is often maintained that birds at communal roosts attract predators by reason of their large numbers and increased conspicuousness. It may well be true that heavy predation does sometimes occur, though probably mainly at very large roosts. Mühlethaler (1952) records that at two communal roosts of Bramblings *Fringilla montifringilla* in Switzerland, said to contain 72 million birds, a number of raptors spent the day at the empty roost sites and preyed on the finches as they arrived each evening. However, in such cases, the actual total of birds taken in proportion to those present must be small. Predation would probably be much more severe if the birds, instead of congregating at single communal roosts, were widely dispersed in a far greater number of individual roosts in less favourable sites; the likelihood of predation, especially from nocturnal predators, would tend to increase in proportion to the total of individual roosts for the predators themselves are usually over-dispersed.

For "social-social" species, there seem also to be definite ecological advantages in social roosting. The communal roost may function as part of a "dispersal system", as first suggested by Crook (1953, 1960) for gulls *Larus* spp. and social weavers (Ploceinae), acting as an "information centre' (Ward, 1965) from which the birds are advantageously dispersed, each day anew, over their feeding grounds. This theory seems preferable to that of Wynne-Edwards (1962) who suggests that communal roosts act as conventional meeting places for "epideictic" purposes, by which the birds assess their own numbers in relation to the local food supply and, if necessary, take steps to regulate the population, chiefly by emigration, before a food shortage occurs.

There is no evidence that the White Wagtail communal roost either has an epideictic function or acts in a dispersal system, for each individual or "pair" returns each day to its own established feeding area (or areas). If there is some other "eco-social" purpose in the social roosting of this species, it is not at all apparent.

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This paper in its present form arose out of discussions with Jeffery Boswall (B.B.C. Natural History Unit) who is at present engaged in a study of the roosting habits of the Pied Wagtail *Motacilla a. yarrellii* in Britain. Acknowledgement is also made to the Department of Psychology, University of Bristol.

Summary

White Wagtails in Egyptian winter quarters are over-dispersed by day in regular individual feeding areas occupied by single birds (often males) or by "pairs" of males and females. The birds collect at a communal roost for the night. There are some variations in the detail of the daytime dispersion in different districts of Egypt, apparently due to variation in food supply, but social roosting is constant.

The White Wagtail differs from many other social roosting species which feed socially by day and often range widely for food. This difference would appear to be correlated with feeding habits, social foraging being of no advantage to the White Wagtail which feeds chiefly on insects that are also over-dispersed in the habitat.

The White Wagtail also differs from most other solitary feeding species which roost solitarily in their living areas. Social roosting has evolved in the wagtail probably as a result of predation pressure. This has selected against solitary roosting, both in the feeding area and in unfamiliar surroundings elsewhere, because neither provide safe, individual roost sites.

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